JANUARY — RYAN S-T MILITARY TRAINER FOR GUATEMALAN AIR FORCE — 1939

Southern Flight

TL501
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The Birdmen's Perch

It's kinda' a surprise to us that there aren't more *correct* answers to our Aviation Quiz. Maybe it's because you smart lads don't bother sending in your papers to be corrected. Whether you know the answers or not, let's hear from you. We'll print the names of the Quiz Club members in an early issue.

MAJOR AL WILLIAMS, alias "Tattered Wing-Tips,"
Mgr. Gulf Aviation Products, Gulf Bldg., Pittsburgh, Pa.

DON'T COUNT YOUR CHICKENS DEPT.

A pilot on a recent hop encountered a large flock of ducks. Coming on them from the rear, he caught up just fast enough so that every 45 seconds the number of birds in sight doubled itself. If he saw the first at 12:03 P.M. and could see them all at 12:12, at what time could he see half of them? And, just to make it difficult, how many birds were there?

(Old T.W.T's almost ashamed to admit it, boys, but he missed the boat on this one. If you want to show him up, send in your answer to be checked.)

CLASSIFIED ADVT.

WANTED:—Party to tell Gulf Oil Corp. how to make use of all the *extra* sludge and dirt taken from Gulfpride Oil. Gulf's exclusive Alchlor process *used in addition to conventional methods* removes as much as *20% extra waste* from this 100% Pure Pennsylvania oil.

ALSO WANTED:—Party or parties interested in obtaining super airplane lubrication. Ask for Gulfpride at the Sign of the Gulf Orange Disc.

AVIATION QUIZ

1. How did the Wright Brothers decide who was to fly first?
2. What famous writer of South Sea tales was a member of the Lafayette Escadrille?
3. Who was the first stunt flyer?
4. Who is the present chairman of the Civil Aeronautics Authority?
5. Give within one million the number of passenger miles flown by airlines per passenger-fatality in 1937.

THIS MONTH'S WHOPPER

Hi, Major!

Pal of mine's wife was the worst back-seat driver in Deaf Smith County, Texas. Why, she used to bring her sister along on auto rides so there'd be someone to keep up the heckling when she had to pause for breath.

That was before my friend ran outa' gas one day near the airport. Then his wife and sister-in-law both went to work at once! Radio operator half mile away turned off his set 'cause the interference was so bad. And Hank Sparks, my friend, claims his ears was almost numb before the gals got their second wind and really went to town on him.

Fortunately there was a supply of Gulf Aviation Gas at the airport. So Hank carted over a couple of gallons and sloshed it into the tank quick for fear the words those females were screeching at him might set it on fire.

Then he crawled back under the wheel and stepped on the starter.

Major, I . . . well . . . I . . . what I mean is—you can't expect no man to believe this except a fellow like yourself that has a faint idea of how powerful Gulf Aviation Gas really is! But when Hank put his foot on the accelerator and let in the clutch, that old car picked up so fast the words from the rear seat never had a chance to reach the front! All he did was drive around in serene unheeding silence for a couple of hours and when he got home those gals were so hoarse they couldn't talk for two weeks!

Joseph G. Magish

Gulf Oil Corporation and Gulf Refining Company . . . makers of

GULF
GULF AVIATION PRODUCTS

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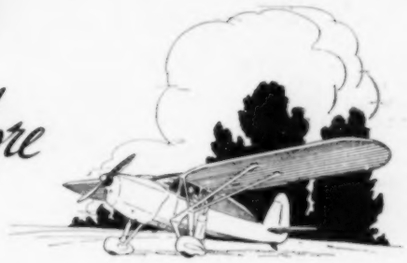
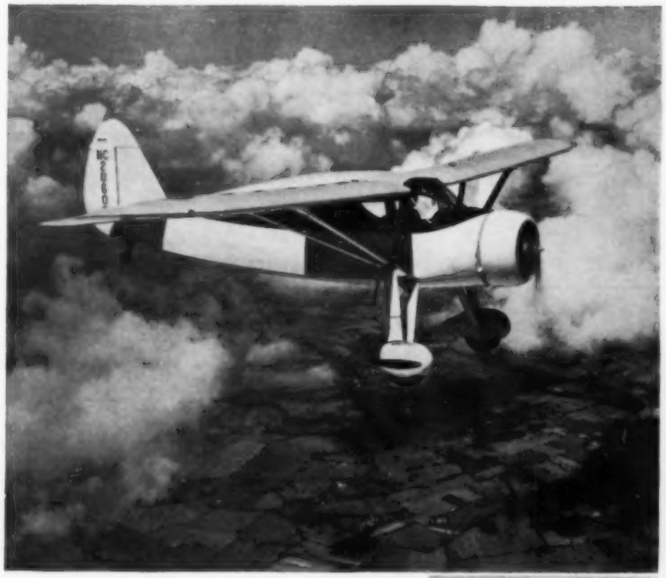
In the FAIRCHILD "24" for 1939

were giving more than ever before





Behind the popularity of the Fairchild "24" are years of proven performance . . . hundreds of thousands of flight hours by hundreds of enthusiastic owners in all parts of the world.

During 1938, for instance, sportsmen, business executives, government officials and commercial operators purchased more Fairchild "24's" than any other 4- or 5-place cabin planes in America.

They bought because, in ease of handling, utility, safety and economy, this ship has achieved a record of being the finest a man can buy regardless of price. To attempt improvement seemed impracticable . . . but we've equipped the Fairchild "24" for 1939 with such added features as hydraulic brakes, a steerable tailwheel, improved landing gear, ventilators of advanced design, optional glass windows, even more beautiful cabin interior and many other new features.

In 1938, the Fairchild "24" was the biggest seller because it was the biggest value. In 1939, this splendid ship is an even greater value . . . and an even more logical choice for the private owner.

NEW Hydraulic Brakes add greatly to ground handling ease and control.

NEW Oleo Design in gear results in straighter roll after landing.

NEW Steerable Tail Wheel (automatic, full-swiveling) combined with the new brakes and oleos, now makes the "24" as perfect on the ground as in the air.

NEW provisions for Airwheels will interest those who operate on rough fields.

NEW Door Windows of Plexiglass or Safety Glass are optional and considerably reduce the noise level.

NEW Ventilators on all models are the airliner type and assure comfort in hottest weather.

NEW Instrument Panel design affords extra space for radio equipment.

NEW Seat Contours with even Finer Upholstery result in a luxury of restful ease and individuality in appearance.

NEW Ranger Engine Mounts and Cowling give smoother operation, better appearance and quicker accessibility.

Complete details upon request.

Air Activities, Inc.

Southwestern **Fairchild** Distributors

Howard Hughes Airport **Houston, Texas**

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Southern Flight

JANUARY, 1939 VOL. XI. No. 1

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Contents:

SPECIAL FEATURES

AVIATION - 1939—Statements by Outstanding Executives 6
INSTRUMENTS FOR INSTRUMENT LANDINGS by J. Lyman and F. L. Moseley 7
THE C. A. A. FLIGHT TRAINING PROGRAM by G. Grant Mason, Jr. ... 10
COMBAT SQUADRONS MAY BE FINISHING SCHOOLS by Tom Ashley 12

REGULAR FEATURES

JUST AMONG OURSELVES—Editorial Comment 7
NEW EQUIPMENT REVIEW—United Static Suppressor, RCA Radio Range Filter, Pioneer Autosyn Position Indicator, Pioneer Magnetic Pilots' Compass, W. E. All-Purpose Receiver, Kollsman Direction Indicator, Fairchild "24", Earth Inductor Compass, Waller Communicator ... 13
NEWS OF THE MONTH IN REVIEW 16
PORTS OF CALL—Correspondence from the Airports and Airways 21
DIRECTORY AND CLASSIFIED ADVERTISING 25

★ ★ ★ ★ ★ Just Among Ourselves ★ ★ ★ ★ ★

The Feeder Line Idea Is NOT Dead

ONE of the greatest services to be rendered by civic groups and progressive individuals throughout our territory may be found in a concerted, vigorous movement for the early establishment of two or three feeder lines on an experimental basis, forcing, if necessary, the allocation of necessary funds for the project.

We are getting fed up with all this rot about the Civil Aeronautics Authority's first big job being limited to placing our major airlines on a sound economic basis. In the first place the C. A. A. is working night and day on that problem and on a multiplicity of other problems just as important. In the second place many of our scheduled air carriers are going to have to do quite a lot towards solving their own sorry predicaments and in many instances they will have to remember that the good Lord helps those who help themselves. The big trouble is, as always, the unfortunate state of mind generally existing throughout the aviation industry that limits concerted thought, opinion and effort to one's own narrow little groove, failing to consider aviation as a composite industry of many component parts, a big little family, as it were, wherein should one member take ill the others will be affected in some measure.

For example, why haven't the air transport companies taken up the feeder line idea and assisted in its promotion? And all those good people who have been harping on national defense in the air—where are they hiding? Surely the airlines realize that a well developed feeder line system would pour additional revenue into their coffers. And the national defense folk must know that a thousand transport pilots flying mail and passengers every day for 365 days of the year are far more valuable from a military standpoint than ten thousand college boys with 50 hours of airport flying.

The one phase of our struggling industry that is very definitely sick is the manufacturing and operation end of our middle category of private aircraft—those fine airplanes that come just under airline equipment and the type of machines that probably would be put to work over a conservative system of mail carrying operations between an established scheduled airline terminal and outlying communities.

We have sufficient executive, piloting and mechanical personnel in reserve for this task. Many of the factories actually need orders immediately to keep open. Yet nothing is done about it. Pilots with over a thousand hours, some with instrument ratings, and mechanics with three to eight years of broad experience are not only going hungry but are being forced out into other pursuits, their investment of years and money a total loss. While nothing is being done about them, the C. A. A. announces a Roosevelt backed plan to train twenty thousand college boys, a noble program but one that should be launched *after* we have developed a definite long range national air policy, devoid of flash-in-the-pan ideas that result in mushroom booms and finally end in sudden collapse after hasty, unplanned expansion. Don't misunderstand us—we want to see a government sponsored flight training program—but first of all the one tottering phase of the business should be bolstered and bolstered quickly.

Feeder lines will not only help towards increased production in many excellent factories that have definite military value by virtue of their continuous operation, but also will absorb licensed personnel, who, through necessity, are having to drop out of the aviation picture.

Although the scheduled air lines in the United States carried over a million passengers in 1938, most of it was repeat business and conservative estimates place the total number of individuals somewhere in the neighborhood of 250,000. Think of the influx of new business that would spring up as a natural consequence of short-haul

operations being made available to scores of communities now off the airline map! If public convenience and necessity are factors in our transportation systems, then surely feeder lines cannot be put down as a premature hope.

Who knows whether or not they are economically unsound? Or that they won't work out? It's all pure conjecture and the only workable formula is to test them out. Appropriate some money and establish three or four routes to be operated experimentally for one year and you'll have the answer.

Don't be misled by the apparent lack of interest in feeder lines since the Kansas City Meeting last October. The idea is definitely NOT dead. But a mere handful of believers can't put it over. The job must have thousands of supporters in all walks of civil life.

Let us hope that it is one of the major subjects for discussion and action at the second annual Southwest Aviation Conference March 2, 3, and 4 in Fort Worth; for if the movement is strong enough and intelligent enough, the little pittance required to inaugurate three experimental lines can be had, especially if the air defense value is properly estimated and presented during these sword rattling days.

It is logical and timely that the campaign should be inaugurated in the Southwest, Middle-West, and South, where the need for feeder services is most apparent, where surface transportation is slow and miserable and distances long, where weather and terrain provide the best combination of physical factors to be found anywhere for experimental operations.

Free Time For College Students

WITH $100,000 of National Youth Administration funds now available for a practical test of an unprecedented civilian flight training program during the second semester at 13 educational institutions all over the United States, the private flying development division of the Civil Aeronautics Authority last month pulled quite an elaborate rabbit out of their hat much to the surprise of everyone. Thanks to the N. Y. A. (a relief organization) for providing the funds.

Frankly, at this writing, we do not know enough about the operating details either to condone or condemn it. At its present stage, the plan appears to be a practical approach to our admitted national deficiency in widespread civilian aviation education; and should the $10,000,000 asked by the President be appropriated annually for training 20,000 students, there is no doubt about the creation of a healthy supply of private pilots that would eventually provide considerable stimulation to non-scheduled civil aviation all the way down the line.

The $100,000 for the original experiment will train approximately 330 students purely as a test. The Authority will provide the approved ground and flight school curriculum but the individual schools will engage their own flight instructors from the ranks of fixed-base operators approved by the C. A. A. as instructors. Between 35 and 50 hours of instruction will be provided each student.

With full and expressed intent on giving aviation its proper place in the vocational training system already established and functioning in the public and private schools of the country, it is quite natural, despite many protests, that the C. A. A. should tie in with our institutions of higher learning especially for the experimental test during the next four months. Not only have the 13 chosen schools pioneered for some years in aeronautical courses thereby providing an established ground school curriculum but the arrangement with them makes for simplicity of administration that would not be possible under any other system.

On such short notice the line would have to be drawn somewhere and high calibre college students represent about the most logical "ready" group of citizens to draw from not only for necessary age requirements but also for the fact that they are already under the control of school jurisdiction and must respect authority, which should be good insurance against waste through drop-outs.

We are well aware of the thousands of young men beyond college walls who would be naturals for the flight training program, and who, through their experience in the "college of hard knocks," might prove even better timber than those in school. But selecting them presents too great a problem under such stringent time limits. The school authorities can attend to this selectivity without loss of time and without confusion.

After the practical test program is completed at the end of the current school term, the private flying development section will then be in a better position to make further recommendations and revisions with more complete knowledge of the task before them and the future course subsidized flight training should take.

We firmly agree that the personnel and equipment used for the program should be that which is now in work-a-day operation. The qualifications of instructors, maintenance personnel and equipment must and will be high. Only by turning over the job to the proper people and by paying a fair price for instruction can quality be insured and success guaranteed. A great deal hinges on the administration of the program for the next few months. If it flops, the $10,000,000 asked by the President will not come through, and the N. Y. A. will be credited with having pooped off a measly $100,000, which is mighty small change to Uncle Sam under the New Deal.

Defense of the Colonel

WE might be a bit presumptive in thinking Col. Charles Lindbergh needs anyone to come to his defense but the fact remains that a new wave of criticism against him for his recent activities in Europe not only nauseates us but brands his critics as ignorant observers of a fast moving drama whose plot is far over their balmy heads.

And to the brilliant newspaper reporter who released the story about Lindbergh's secret mission of gathering important military information abroad for the consumption and benefit of our own war department a dull thud for getting the water so muddy that our finest "minister without portfolio" no longer has access to the factories and airports of nations across the seas. Whether or not Lindbergh was on a European junket for the purpose of important military information, or the more likely prospect for the purpose of private observation in his capacity as an international citizen of aviation, the results of the criticism and wild, unpremeditated stories are the same. His goose is cooked insofar as wide-open welcomes to foreign nations are concerned.

He probably doesn't care, no doubt quite accustomed by now to being misunderstood and crucified. The irreparable loss has already been committed and we as a nation are the losers. If war broke out and the Colonel came home to provide important information not contained in "G-2," the chances are he would be minus valuable data that could have been his, all on account of good old fashioned American bungling.

Aviation-1939

THIS year should be a good one for the aviation industry in all of its phases — manufacturing, transport, military and private flying.

Our country has suddenly become conscious of the fact that the airplane is a vital factor in its national life, and the government's various expansion programs will unquestionably establish for us the leadership in aviation which this country is entitled to have.

The Civil Aeronautics Authority's own private pilot training plan will get under way this semester in thirteen colleges and universities throughout the country, and if it is successful, it will be the first step toward a comprehensive program for the training of 20,000 young men and women annually in the art of flying.

—Edward J. Noble, Chairman
Civil Aeronautics Authority

GENERAL business conditions have improved; public confidence in aviation is strengthened; the business man is including air transportation in the plans for his business and we will have two national fairs during the coming year. 1939 will be a good year for air transportation.

—C. R. Smith, President
American Airlines, Inc.

MY BELIEF is that the aviation industry faces its best year in 1939. The manufacturing end of the business will unquestionably have a very busy year due to the military program as well as the great increase in demand for civil flying.

The air transport industry made substantial gains last year in passenger traffic, mail and express. There is every reason to believe these gains will be continued into the new year. The Civil Aeronautics Authority is functioning and the industry feels implicit confidence in the results of the functioning of that body.

—T. E. Braniff, President
Braniff Airways, Inc.

THE business recession of 1938 naturally curtailed the sale of any articles which could be classified as a luxury. The aircraft engines which we manufacture cater primarily to the sport market and we suffered accordingly. The current interest in rearmament and in the training of civilians as well as military pilots will unquestionably react in our favor during the current year. Any orders for aircraft, to be produced on the Pacific Coast, will likewise be felt in this plant as we are now engaged in precision machine work for all of the principal manufacturers.

—Gardner W. Carr, President
Menasco Manufacturing Co.

AVIATION Equipment and Export, Inc., looks forward confidently to continued demand for American made planes and aviation equipment in the foreign market. I believe the superiority of our products is becoming a recognized fact throughout the world and expect to see a healthy increase in aircraft exports during 1939.

—Samuel Niedelman, President
Aviation Equipment and Export, Inc.

THE year 1939 looks substantially brighter in prospect than the year 1938. Any further improvement in industry will be reflected in increased air traffic. Naturally the two fairs, at New York and San Francisco, will be of material assistance.

There are numerous problems which must be dealt with during the coming year, including equipment. Introduction of four-engined airplanes in actual service will probably not be accomplished during 1939. An intensification of the program of public education is needed. An excellent move in this direction is the agreement among the airlines jointly to sponsor a $300,000 educational advertising program in conjunction with the manufacturers. It is also important evidence of the constructive intention of the airlines to act together in their common merchandising problems.

—W. A. Patterson, President
United Air Lines

THE creation and operation of the Private Flying Division of Civil Aeronautics Authority will, I believe, greatly improve the market for itinerant aircraft and other accessories during 1939. If the proposed educational program develops as indicated, this market growth should be rapid and of constantly increasing acceleration, extending into later years. I look forward to large increases in the safety factors of flight occurring from ground school education, more reliable and safer aircraft and acessories, and continually improved Federal Airways facilities and procedures.

—David S. Little, Manager
Aviation Radio Sales
RCA Manufacturing Co., Inc.

I DO not see how 1939 can help but be a banner year for aviation. We know that the country is alive to the need of a stronger air force, and while I discount the large number of planes, pilots and mechanics reported in the press, I do think that we will see a healthy increase on a long range plan, and I think that such a program is all that is required, both from the viewpoint of National Defense and the entire industry. Furthermore, there seems to be every wish on the part of most Government agencies to give consideration to the existing industry, and I think that we can all look forward to getting all the business we can handle.

—C. S'. 'Casey" Jones, President
Casey Jones School of Aeronautics

TO MY mind the significant fact about the aviation outlook for 1939 is not the great technical advances in aircraft made by designers and manufacturers in the year just closed but the unqualified public recognition of this progress. Both the commercial world as well as the military have completely accepted air-craft as essential tools.

—Glenn L. Martin, President
The Glenn L. Martin Co.

IN MY opinion, one of the most important problems facing the aviation industry is technical development. Recent progress in the art has been almost incredibly rapid, and has been achieved only through steadily increasing expenditures for research and development. For the future, commercial aviation seems destined for continued growth, and there is little question that aviation will play an expanded role in national defense. The technical progress that will be required to keep pace with aviation's growing sphere of activity constitutes a challenge to our imagination, our abilities and our resources.

—Donald L. Brown, President
United Aircraft Corporation

IT IS my sincere belief that American aviation, after 35 years of progress, is now entering the greatest era in its entire history.

Having demonstrated that air transport is the fastest and safest means of transportation over both land and water, American aircraft now girdle the world regularly performing tasks that a few years ago would have been regarded as miracles.

This and the years ahead will someday be regarded as the golden age of aviation.

—James S. Pedler, Manager,
Aeronautic Sales Division
The B. F. Goodrich Company

AVIATION in 1939 will show no doubt more progress than in any one year since Lindbergh catapulted it into a boom in 1927.

Production will be greater. Trans-atlantic flying on schedule will be an advent to great possibilities. Our military airplane development will demonstrate far greater speeds in all tactical types.

The National Air Races will be attended by larger numbers of people, and greater speeds will be developed.

Air line traffic will show a definite increase as will private and industrial flying, which will aid commercial aircraft manufacturing.

—L. W. Greve, President
Cleveland Pneumatic Tool Co.

(Continued on Page 20)

Instruments for Instrument Landings

This paper traces the history of instrument landing from the standpoint of instrumentation. No specific system is discussed in detail but instruments are referred to in relation to the problem of conveying to the pilot information concerning motion in six axes. The steps leading up to the development of a combined indicator are outlined. Reference is made to automatic landing and the adaptability of the combined indicator as a monitor is discussed.

J. Lyman and F. L. Moseley
Sperry Gyroscope Company

IT is paradoxical that though the modern transport air liner can fly through nearly any type of weather with perfect safety, it can land only where the weather is suitable. This is a situation which we all know will not long endure and yet it is one which has defeated all attempts to remedy it through a period of nineteen years. It is true that the first instrument landing occurred nine years ago, but it is equally true that no reputable air line would consider, even at this present date, actually landing a load of passengers on a completely fog-bound airport. This is not said in criticism of those who have devoted unceasing labor toward the solution of the problem—and there have been many of them—but rather to point out as forcefully as possible the difficult nature of the problem.

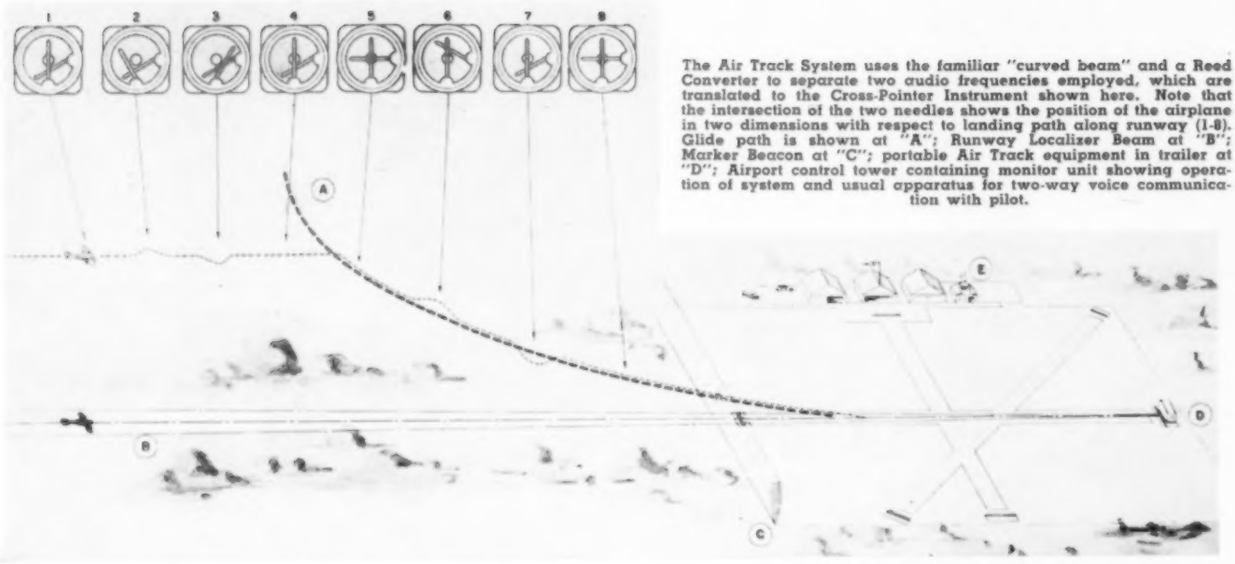
When one considers the various factors involved in bringing an airplane down to a smooth and gentle landing by means of instruments alone, it is not surprising to find the maneuver a very complex one. In the first place aircraft have no less than six degrees of freedom, and motion in all six must be rigidly and simultaneously controlled. For it to be properly controlled this motion must be detected, analyzed and presented to the pilot in such a way that he may act to direct the motion to suit his purpose. The entire process of an instrument landing consumes less than three minutes, so it may be seen that there can be little delay between perception of motion to correction of it. There is also a psychological factor which must not be neglected. In ordinary instrument flying this has long been recognized as serious, but in instrument landing it is even more acute. The pilot is always aware that the slightest momentary mistake or momentary failure of any link in the system will result in instant disaster. He has always been taught, as has the mariner before him, that close approach to terra firma is dangerous. And to add still further to the complexity of the problem there is the continuous variable of wind and weather.

Although the field of this paper has to do exclusively with instruments which are required to make landings when external visibility is obscured, it is nearly impossible to discuss the instruments themselves without mention of the ground references upon which many of them depend. It is interesting to trace the development of the technique of instrument landing from the standpoint of the instruments used in the past, and to note the trend of this development up to the present time. How impossible some of today's commonplace procedures would have been a few years ago. For example, the radio beam along which the transport flies so easily was first tried in simple form fifteen years ago, when the Bureau of Standards began a series of experiments with two loops at an angle of 135° to each other. They found they were able to lay down an equi-signal zone just as we have it today with keyed characters defining the two sides of the course. But imagine what their troubles must have been; the transmitting and receiving equipment of the day was fussy and unreliable; ignition shielding was nearly unknown. However, a course was laid down along a straight ground track and the fundamentals were established which are in use today. Instrumentation consisted of head phones for the pilot. The turn indicator had just been introduced, and of course there was no directional gyro, so that hunting back and forth across the beam must have been a rather troublesome defect.

THE first instrument really related to present blind landing ideas appears in the 1928 experiments of Diamond and Dunmore. By this time, much additional work had been done on the radio beacon; fairly reliable tube transmitters were available and some very good results were secured. Lateral position relative to the radio course was established by observation of a tuned-reed indicator. This reed indicator necessitated the transmission of two different modulation frequencies on the two sides of the course; that is, instead of an N side and an A side, off-course to left or right was defined by a 65 or 87 2/3 cycle tone modulation on the carrier. The two reeds in the course indicator were tuned one to each side frequency; as the ship moved to left of course the left reed increased its amplitude and the right reed decreased; thus the course could be flown by always maneuvering the ship to keep the reed amplitudes equal. This tuned reed instrument was the direct forerunner of the vertical needle on the cross-pointer instrument of today.

Although the discussion so far has been entirely on the guidance of an airplane over a pre-selected ground path to a landing field, much other information must be furnished to the pilot. For example, he must know how far he has progressed along this path. An early attempt to show such information was a distance meter. While experimenting with a tone modulated localizer it was observed that in order to maintain fixed course sharpness as the station was approached a system of Automatic Volume Control was necessary in the receiver. Now in any AVC system, the amount of current fed back to decrease the sensitivity and hold the receiver output constant, is proportional to the signal strength. Hence, it was only necessary to add a microammeter to the automatic volume control circuit in order to obtain a fairly good distance meter.

Another of the early methods for position marking was one in use today on route flying—that is the intersection of two ranges to give a fix. As worked out for landing, a low power range was set up on one side of the field to intersect the instrument landing beacon or field localizer. The carrier frequency of this cross range was the same as that used on the localizer, but it was modulated by a different tone, and indicated on a single tuned reed, mounted as a separate instrument. Appar-



The Air Track System uses the familiar "curved beam" and a Reed Converter to separate two audio frequencies employed, which are translated to the Cross-Pointer Instrument shown here. Note that the intersection of the two needles shows the position of the airplane in two dimensions with respect to landing path along runway (1-8). Glide path is shown at "A"; Runway Localizer Beam at "B"; Marker Beacon at "C"; portable Air Track equipment in trailer at "D"; Airport control tower containing monitor unit showing operation of system and usual apparatus for two-way voice communication with pilot.

ently this was the first form of our present marker beacon.

Steps in the development of the marker beacon included use of a new and much higher radio frequency to be received separately from the localizer; revision of the modulation frequency for ease in filtering and better adaptability to aural check, and the substitution of a signal light for the tuned reed marker indicator. The marker beacon idea has been extended and as now contemplated will have three uses; on the airways as a position marker and positive cone of silence device, and in a landing system to establish two positions along the field localizer, one remote from the field at the point where the instrument landing procedure begins, and a second at the field boundary, as notice that the safe landing area has been reached.

WE now see that the radio means have been developed over a fifteen year period to a point where guidance on a straight ground track is furnished, together with position check points distributed along that track. That is, the radio aids for a single plane of operation are quite complete. Since the airplane demands two planes of motion we must extend our guidance to the vertical to furnish to the pilot means for making a safe descent; safe as to rate, and proper clearance of ground obstacles. Broadly, this may be done in two ways, each of which sets up an imaginary guide path down which the ship is flown. One way is by known and controlled rate of descent from a fix in space remote from the landing field. This method has been tested extensively in the Army and involves the use of a radio emission as a marker at the point where the descent is to begin. From this point, to contact with the field, a constant rate of descent is maintained by the use of the rate of climb indicator and the sensitive altimeter.

The second method involves the use of a flight path established by radio. Here again are several possibilities. Diamond and Dunmore proposed to set up a straight line path by turning a doubly modulated localizer over on its side so that the sides of the course lay one above the other and became the upper and lower limits of the flight path. Construction of apparatus for this system was started, but, before it was placed in use, Dunmore saw that a single radio emission could be used with great simplification in the transmitting and receiving elements of the system. This is the curved glide path of today.

The system is now nearly complete as far as radio is concerned. Guidance in the vertical plane on the glide path system is virtually the same as it was in 1928 when the Diamond and Dunmore experiments were first carried out. A line of constant signal intensity is flown by reference to a field strength meter which is the familiar horizontal needle of the cross pointer instrument. Up to this point, the fundamentals had all been worked out by 1928.

Having briefly traced the development of radio aids to instrument landing, let us see what was done with flight instruments during the same period. In this field we find the Guggenheim fund, Lieutenant James Doolittle, Kollsman, the Sperry Gyroscope Company, and many others contributing. Under a grant from the Guggenheim fund, Doolittle was studying instrument landing and came to the conclusion that further sensitivity in altitude indication was very desirable. With encouragement from the Guggenheim Fund the Kollsman Instrument Company succeeded in producing a very excellent sensitive altimeter, reading easily to ten feet. With the intersection of the glide path and the outer marker as a check point for altitude, this altimeter became a valuable guide as to progress along the glide path.

During the landing procedure, the position of the aircraft is determined in reference to the glide path and localizer beams, observed in the cross pointer instrument. The pilot is notified by the marker beacons as to his progress along the glide path, but, while all this is underway, it is still very necessary to fly the airplane. A line of position, such as furnished by a radio beacon or field localizer is most difficult to follow unless its bearing is known and used as a steering guide on some dead-beat instrument in the airplane. The magnetic compass is obviously unsuitable due to inertia, imperfect damping, and turning error. The turn indicator gives notice only that a straight or curved course is being flown, but leaves the course angle to be determined from the magnetic compass. Realizing the limitations of the available instruments, the Sperry Gyroscope Company produced a trial model of a directional gyro and in spite of the many difficulties with this early instrument, it was found of great value in steadying the ship down on the localizer or any ther desired course.

The most glaring gap remaining in the picture is now

the inability to directly determine the attitude of the aircraft. We have indirect means such as the turn and bank indicator, but this information is of little value during the final stages of an instrument landing. Here the ship must be flown most accurately; the wings must be level, and the fore-and-aft attitude must be such as to smoothly follow the glide path to safe contact with the ground.

Once more the urgings of Doolittle and the Guggenheim Fund were successful in getting one of the instrument makers to produce what was needed. The Sperry Gyroscope Company brought out the artificial horizon, now familiar to all, and thus filled the last gap in the chain of indispensable instruments for instrument landing.

We sometimes hear instrument landing referred to as a problem in the control of a free body in six axes, three of translation and three of rotation. Suppose we examine the problem briefly, in this light, and see how the instruments so far developed fulfill the theoretical ideal.

FIRST, what are the axes? In translation, the ship can obviously move ahead or longitudinally, sidewise or laterally, up and down, or vertically. In each of these axes the plane will have a position and a velocity.

Considering the axes in order, in the longitudinal axis the ship has a position, in this case, in reference to the landing field. This position will not be continuously indicated to the pilot, but only at selected points, that is, at the intersection of the inner and outer markers along the glide path. Velocity over the ground will be indicated by the air speed meter corrected for the wind, which must be known. Actual flying speed is of course directly indicated on the air speed meter, and is of great importance. However, as instrument landing technique is now developing the air speed indication need not be observed continuously as the speeds on the landing path will normally be well above the threshold of stall.

In the transverse axis, position indication is of the zero-reader type, that is correct position on the localizer is shown, but deviations are shown only relatively by the movement of the vertical needle of the cross pointer instrument. Velocity, or rate in the transverse axis is not indicated, but has been the subject of a good deal of theorizing and experimentation by many investigators of instrument landing. In a perfectly operating system, the speed of needle movement across the cross-pointer instrument face will be an excellent indication of the transverse velocity of the ship across the localizer pattern.

In the vertical axis, in the glide path system, vertical position should appear accurately at the two intersections of the glide path and the outer and inner markers. At all other points, vertical position is automatically taken care of by the glide path slope. Very nearly the same is true of vertical velocity or rate of descent. This may be determined when desired by reference to the rate of climb indicator or by observation of needle speed on the senitive altimeter. Ordinarily it is of no importance, as the rate of descent was chosen when the glide path was initially adjusted to the field. In the vertical axis then we may say that position and speed are shown as correct on the horizontal needle of the cross-pointer instrument. Deviations from correct position are shown but no actual magnitudes.

The vertical axis is unique in that we sometimes wish to know acceleration, in addition to position and velocity. At the point of contact with the ground, the vertical velocity of the ship suddenly becomes zero, and the rate at which this occurs is shown on an accelerometer, calibrated in gravitational units. Thus a land is said to be 2G, or 3G, as the force exerted on the landing gear is twice or three times the normal pull of gravity on the mass of the ship.

In addition to freedom in three axes of translation, the airplane has freedom in three axes of rotation. As applied to a ship at sea these axes would be called yaw, roll and pitch while in aircraft they are known as turn, bank and pitch.

Bank, considered independently of turn, is indicated to the pilot on the gyro-horizon and the ball bank indicator. When subjected to the centrifugal force of a turn, the ball indicator ceases to be an amount instrument and becomes instead a zero-reader device to show correct bank for the rate of turn being used.

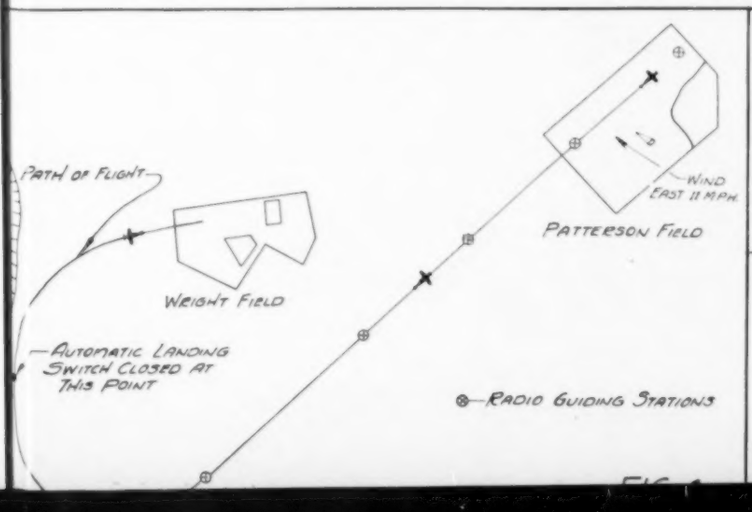
Turn, as to amount, is indicated to the pilot by the directional gyro, usually in degrees from magnetic north. Rate of turn is shown on another gyro instrument, the rate of turn indicator.

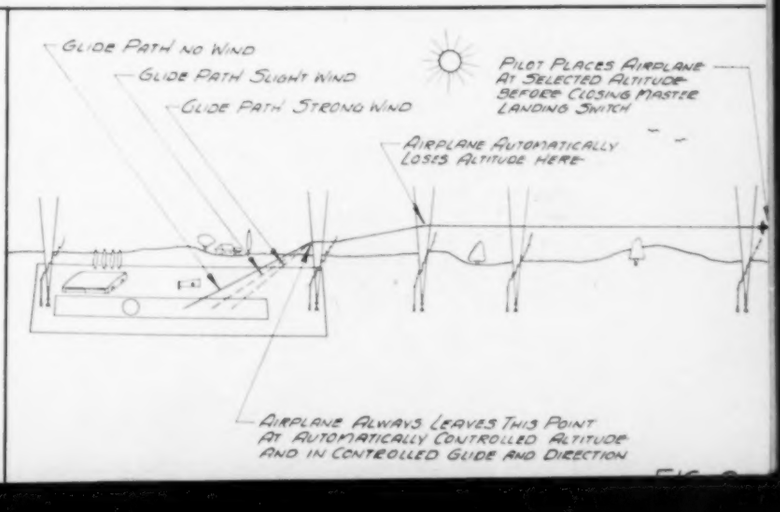
Pitch is shown by the movement of the horizon bar on the gyro instrument. Rate instruments are not available for the roll and pitch axes and apparently are not needed.

In the landing operation, the importance of all motions in these six axes is about equal. If the translation axes are disregarded, the field may be over or undershot, or the runway may be missed entirely. If the rotational axes are not closely watched, the plane may reach an unsafe attitude, striking a wing when near the ground, stalling on the glide path, or sawing back and forth across the localizer.

(To Be Concluded)

The Army Air Corps' automatic landing system developed by Carl J. Crane and George V. Holloman, employs the Sperry Gyro Pilot as the automatic flight control feature of the airplane. Figure 1 demonstrates airplane placed within range of radio reception of the ground radio facilities, and headed 180 degrees away from the direction of final landing. When the pilot has placed the airplane at a selected altitude taken from the sensitive altimeter in the vicinity (20 miles or less) of the landing field, the master landing switch is closed and the airplane proceeds through the flight routine shown in Figure 2.




GLIDE PATH NO WIND
GLIDE PATH SLIGHT WIND
GLIDE PATH STRONG WIND
PILOT PLACES AIRPLANE AT SELECTED ALTITUDE BEFORE CLOSING MASTER LANDING SWITCH
AIRPLANE AUTOMATICALLY LOSES ALTITUDE HERE
AIRPLANE ALWAYS LEAVES THIS POINT AT AUTOMATICALLY CONTROLLED ALTITUDE AND IN CONTROLLED GLIDE AND DIRECTION

The C. A. A. Flight Training Program

During the All-American Air Maneuvers in Miami a member of the Civil Aeronautics Authority cleared up many misconceptions surrounding their flight training program. Here is his story told at the private fliers banquet.

G. Grant Mason, Jr.

THE first phase of our training program which was announced recently by the President will be put into effect during the second semester of the current school year at thirteen selected colleges and universities throughout the country. Because funds were needed immediately to give the Authority's plan this practical try-out before attempting to launch the full-scale program of training 20,000 pilots a year, and because these funds were allocated to us from the National Youth Administration, the impression has been created in some quarters that our flight training program is a National Youth Administration project. This is a misconception that I would like to clear up once and for all. The training program was developed by the Civil Aeronautics Authority and will be carried out by the Civil Aeronautics Authority. The initial funds required—$100,000 for the training of 330 students at educational centers selected on the basis of the pioneer work they have done in actual flight training—simply are being supplied to us by the National Youth Administration.

If the results obtained between now and next June prove that our program is as sound in fact as it seems to be in theory, the training pattern developed at our selected educational demonstration centers will be applied during the 1939-1940 school year at several hundred schools and colleges throughout the United States. We have estimated that the full-scale plan which calls for the training of 20,000 pilots a year will cost $9,300,000. We anticipate that a separate appropriation will be made by Congress for this amount. In any event, no matter where the funds come from they will be administered by the Civil Aeronautics Authority, and the training program carried out under its close supervision.

There also seems to be a good deal of confusion concerning the method in which the actual flight training is to be carried out. From the inception of our plan, the Authority has endeavored to make it clear that any training program which it sponsored would utilize the existing facilities of the aviation industry, thereby carrying out the mandate of the Civil Aeronautics Act to encourage and develop civil aviation. Specifically, this means that we intend to utilize the competent civilian flight instructors now available throughout the country, and to use the self-same training planes with which they are now teaching men like you to fly.

THOSE of you who are already familiar with the flight training that has been done at such institutions as Purdue University know that it is carried out through the medium of local flying instructors. This is the technique we intend to apply universally to the Authority's training program in the schools and colleges of the country. We contemplate nothing that will upset the existing facilities for civilian flight training. On the contrary, it is our plan to strengthen and stimulate the private flying industry in every possible manner. Our program is designed to utilize existing airports in the vicinity of the schools and colleges included in the plan. In effect, local flying instructors will simply become faculty members of the educational institutions with which they will work under the Authority's program. The flight training to be given by them will be to all intents and purposes a simple school or college extension course which, like the other extension courses, can be conducted anywhere and does not necessarily have to be given either within the four walls or on the campus of the educational institution responsible for it.

We intend, of course, to establish strict standards for the instructors who will be engaged in this training plan and paid a fixed rate per hour for the flying time which they will give in their own ships to students selected for training. I don't need to tell you that this sort of supervision is of vital importance to the success of our program. We cannot afford to transplant to an educational flight training program the appalling accident rate that now mars the instructional and early solo phases of private flying. Nothing could be more disastrous than a bad series of accidents in a school and college flight training program. For this reason alone it is imperative that we hold on to the type of instructors who have already established an enviable safety record for themselves in the few academic schools which now give flying training, and to see that others of the same type are in charge of similar work when it is undertaken at several hundred colleges in all parts of the country.

ESSENTIALLY, the Authority's plan simply proposes to give aviation its proper place in the vocational training system already established and functioning in the public and private schools of the country. Approximately $22,000,000 of federal funds are now expended annually on such vocational training. The increasing importance of aviation, both as an economic factor in American life and as a necessary back-log to the national defense, amply justify its inclusion in a federally sponsored vocational training program.

That the goal of 20,000 pilots a year which we have set in our training program is easily attainable from the 1,200,000 young men and women now enrolled in our colleges and universities is axiomatic considering the tremendous interest of modern youth in aviation.

Difficulty is anticipated, not in getting the desired number of young men and women to fly when they are provided with an opportunity to do so, but in setting strict yet fair standards and devising other means of holding down enrollment to a manageable figure.

Since the Act of Congress creating the Civil Aeronautics Authority specifically sets forth that one of the primary responsibilities of this new agency is to foster the development of aviation in the interests of national defense, the Authority considers that it is its duty to formulate and carry out a program which, to a large degree, will meet the threat of aeronautical eclipse by foreign and perhaps unfriendly governments which now faces the United States.

It has no intention of infringing on the prerogatives of the armed forces of the United States or of interfering with these services' clear cut responsibilities in the field of air defense. It is determined rather to supplement matter, in the world.

their work and to assist them in every possible respect.

The Authority feels that, by careful coordination of its program with those of the Army and Navy, it will be possible in the event of national emergency to expand the regular military flying services from a reservoir of civilian airmen and aircraft surpassing anything of the sort ever before conceived in this country, or, for that

BY limiting flight training to college students of 18 to 25 and requiring them to meet the present physical standards for a commercial pilot's certificate, the Civil Aeronautics Authority program will insure that a high percentage of the men thus trained will be able to meet both the physical and educational standards of the military flying services. Thus, it will create a valuable source of supply for these services both for peace-time training purposes and in time of national emergency.

Since the Authority's training program was announced, we have had considerable correspondence from aviation magazines and other publications, as well as from private individuals indicating a fear that our plan ignores the larger and well-established flying schools. This reasoning apparently is based on the fact that such flying schools were not specifically mentioned in announcements of our plan, and on the erroneous conclusion that the Civil Aeronautics Authority's training program is the only step contemplated by the Federal Government in strengthening the country's air defenses and giving it a sound and thriving aviation industry. Again I would ask you to be patient and not jump to the conclusion as certain people seem to have done that our program is the whole story. I think I can tell you that it is only part of the story and it should be significant, pending further announcements, that you have heard no cries of protest about "discrimination" from the larger flying schools themselves.

The Authority's plan includes provision for the continued training along advanced lines of the best qualified student pilots throughout their college careers and on an alumni refresher-training basis thereafter in order that they may be assured of a means to keep up their flying and maintain their value as a national defense reserve. Many such students inevitably will continue their flying on a private basis and purchase planes of their own when they become established in their chosen professions after graduation from college, thereby furnishing a tremendous stimulus to the aviation industry as a whole.

The Civil Aeronautics Authority developed its program after consultation with many leaders of the aviation industry. It is convinced that in addition to building up a valuable aeronautical reserve of young men soundly versed in the fundamentals of flying, the plan will stimulate a healthy development of the aircraft manufacturing industry and that the two things together will create a back-log of inestimable value ot the nation's air defenses.

Only by such an approach, it believes, can the United States adequately safeguard itself against the vast aerial expansion programs now being pressed with fanatic zeal by foreign powers unless it is to emulate their war-like preparations. It is more in keeping with the American spirit of preparedness to build up a great pool of men and machines, dedicated to and engaged in everyday business and pleasure, but yielding first place to no other nation in flying skill or technical development, and quickly adaptable to military needs in the event of war.

THE Civil Aeronautics Authority program embodies adequate ground school courses as a prerequisite to all flight training. One of the serious weaknesses in the more or less haphazard development of private flying to date has been the sketchy and sometimes non-existent ground instruction of student pilots by instructors and flying schools whose standards have not met the requirements for formal approval by the Civil Aeronautics Authority.

Heretofore private flying has been marred by an alarmingly high percentage of accidents, fatal and otherwise. It is felt that this has been due in part to the lack of adequate and uniformly enforced standards of instruction, both preliminary to and during flight training, and that steps should be taken to remedy this situation.

Since the Civil Aeronautics Authority is charged with insuring the safety of flying as well as its orderly encouragement and development, it is also imperative that accident prevention should be undertaken from another approach—that of basic improvement in the vehicle used for flight training—as well as in the methods of instruction. Specilcally, the Authority believes that steps should be taken to encourage built-in safety in the future con-

(Continued on Page 26)

Dewey Eldred of Willoughby, Ohio, who set a new international record for light seaplanes on January 7, taking off from Biscayne Bay during demonstration flights in Miami. This is the 50 hp Lycoming powered Taylorcraft with which Eldred made his record flight from New York to Daytona, Florida.

COMBAT SQUADRONS May Be Finishing Schools

A personal interview with the Chief of the Air Corps reveals proposed changes in training procedure and recites the position of our defensive air force.

Tom Ashley

EXPANSION of U. S. air power as recommended by President Roosevelt and other governments and war department officials promises several complications for the General Headquarters Air Force, combat units of which carry the responsibility of defending the continental limits of the nation from aerial attack. While more planes, more pilots and more men form the ultimate goal of the expansion, prospects of the immediate future indicate the air force will be "on the spot" in more ways than one.

Major General Frank M. Andrews, commanding general, informed the writer in a recent interview that the GHQ Air Force anticipates added responsibilities in providing "fishing school" training for student army pilots. Another way of wording this would be to say that high-geared pilot training at the Air Corps Training Center at San Antonio, Texas, will necessitate a new policy of flight training, in which both the school and the combat uints will be used for instruction. Students, it would appear, would receive primary training in San Antonio as in the past but for advanced training they would be shipped to the various combat branches of the tactical air force in the field.

The anticipated training system will handicap air force operations in several ways. They face the task of maintaining tactical efficiency and graduating embryo pilots into combat status at the same time. At present, air force units are maintained on a wartime basis and are actually "M-day" fighting squadrons, constantly in readiness for immediate action. Intensive tactical training, maintenance of airplane strength and streamlined administrative functions are the chief requirements of an air force ever poised for quick action. To add to these the responsibilities attendant to student training will be to seriously affect its ability to perform its tactical mission.

There are two principal reasons for the shifting of advanced training from the school section to the combat area. One is the necessity of speeding up primary training to the point where existing school facilities will be required for the primary stage alone, crowding out advanced training. The other is found in the modern equipment with which combat units are equipped and which young pilots entering the service ultimately will operate. The new attack planes, pursuit craft, bombardment planes and observation types are vastly different from the training planes at the school. They are faster and more maneuverable. They contain controls, gadgets, instruments and armament installations which require constant attention and complicate the relatively simple art of just flying. In the highly specialized tactics of combat operations especially do they require expert piloting.

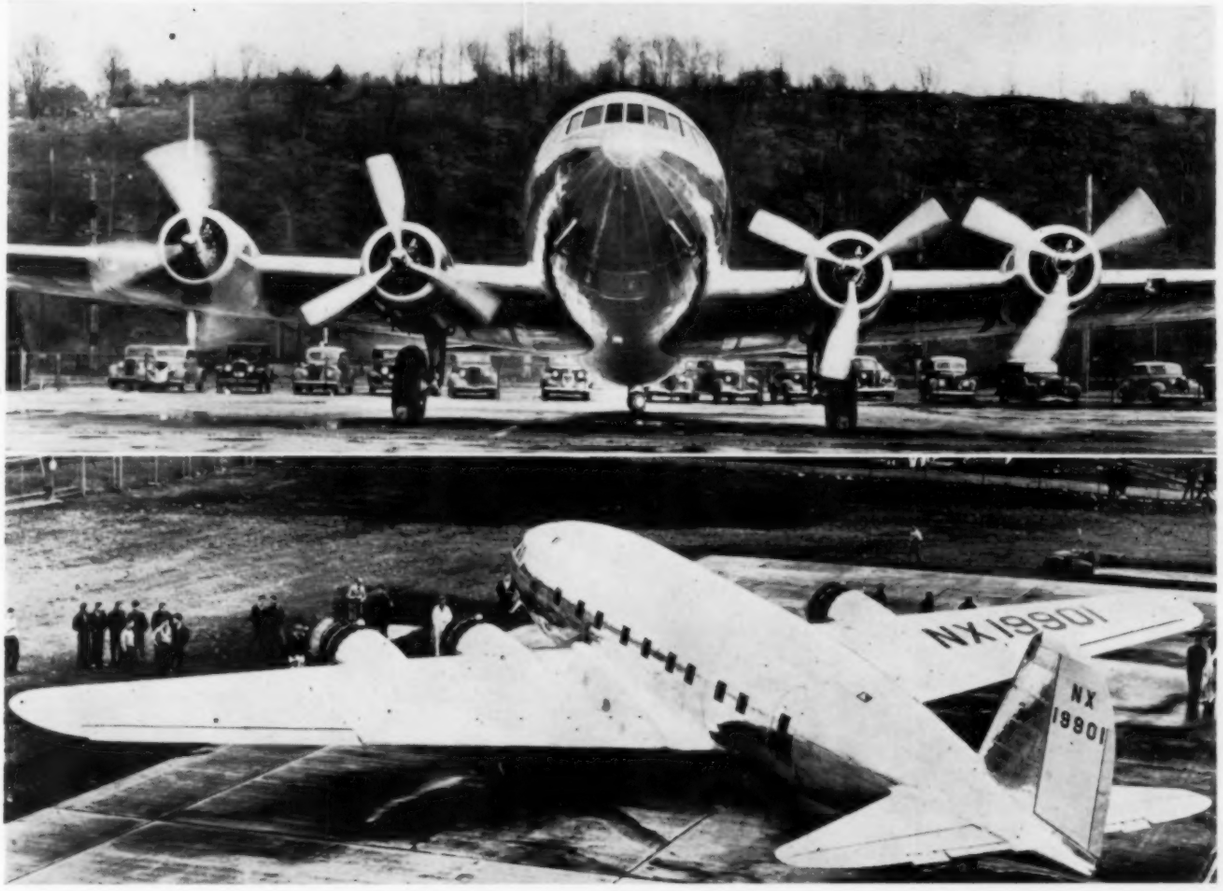
"Finishing School" training has been found necessary in tactical operations during the last year, when the air force received delivery of several new types of combat planes. Now that expansion appears imminent, the need becomes even more acute.

To complicate the picture there exists already serious shortage in tactical pilots who would serve as instructors, other personnel, housing facilities and combat airplanes.

(Continued on Page 20)

Attack Bomber for the Argentine
This export model is one of a fleet being delivered to Argentina by the El Segundo Division (Northrop) of the Douglas Aircraft Company. Armament includes machine guns and small bombs for defensive units against ground troops and lines of supply.

New Equipment Review



Two Views of the New Boeing Stratoliner
Now undergoing flight tests at Seattle, this Boeing 307 Stratoliner is the first of a fleet being produced for Pan American Airways. Carrying 33 passengers, four 1100 hp Wright Cyclones furnish the power and turn Hamilton Standard Hydromatic constant speed propellers. It has a wing span of 107 feet, a length of 74 feet. Initial flight was made December 31 with test pilot Eddie Allen at the controls.

UNITED'S STATIC SUPPRESSOR

UNITED AIR LINES announces the successful development of a static suppressor insuring normal reception of both the directive beam and voice radio signals irrespective of the intensity of static conditions. The device is manufactured by Bendix Radio Corporation, whose engineers collaborated in the development, and has been installed on United's entire fleet of Douglas transports.

When the pilot encounters static, he presses a button electrically releasing a wire from the tail of the ship into the slip-stream which extends to its full length trailing behind the plane. Static electricity which formerly leaked off various parts of the plane now discharges harmlessly through a special suppressor. Each plane carries a reserve wire. United engineers discovered that static electricity was discharged from those points on the airplane that were the sharpest, and after 25,000 miles of flight and months of experiment, the solution indicated was to employ a fine steel wire of a diameter much smaller than the sharpest point on the plane. The wire is installed with a newly-designed resistor. The device is now available for installation on all planes.

RCA RADIO RANGE FILTER

THE new RCA Model AVA-38 Simultaneous Radio Range Filter is now on the market after extensive research. Size and weight factors were the chief considerations in designing the new equipment. Electrically, the filter unit consists of two sections, the "telephone" and the "range" sections. The "telephone" section is a band-rejection filter designed to suppress the 1020 cycles-per-second modulating tone used for the range signals and to allow the voice frequencies, essential to good intelligibility, to pass to the headphones with little attenuation. The "range" section is a bandpass filter which allows the 1020 cycle tone to be transmitted to the headphones but suppresses the major portion of the voice frequencies so that, during transmission of weather reports, the range signals are heard without interference. A three-position switch is used for switching the headphones from one signal to the other or to a combination of both. Outstanding features are: weight: 1.75 lb.; outside dimensions: 2 in. x 2-15/16 in. x 4-7/16 in.; electrical characteristics per B. A. C. Spec. No. 189; separate input and output circuits; drilled mounting flanges for ease of mounting in any position; approved for airline use; supplied complete with selector switch and reverse etched selector switch plate; full protection against temperature and humidity; grey wrinkle finish aluminum case.

PIONEER AUTOSYN POSITION INDICATOR

PIONEER INSTRUMENT COMPANY has developed a radically new "Autosyn" Position Indicator, operating on direct current. The new instrument informs the pilot of his wheel position, his flap position, and the functioning of his wheel locks, all from one remote indicator, which has three small flags each luminously painted to represent one wheel on the small representation of an airplane, with the flags moving up and rown as the wheels actually do. When the wheels are down but not locked, the flags move up and show red warning markers. Then, as the individual wheels move up, the wheels on the Miniature Airplane move accordingly. When the wheels are up but not locked the red warning markers are visible under the Miniature Airplane. As the wheels are locked "up," the red warning markers disappear and the wheels are completely out of sight.

If at any time the D. C. power should be turned off, all three wheels drop down out of sight and three markers appear bearing the word "off." At the bottom of the dial is a representation of an airplane wing and flap, which acts as a pointer moving across a scale in accordance with actual flap motion. The Indicator is available with the Pioneer Ring Light, weighs less than one pound and the entire system of indicator and four transmitters weigh about 2½ lbs. The system draws less than 1 ampere at 12 volts or about .5 amperes at 24 volts. The transmitter is a simple resistor with wiping contact mounted in a watertight, shielded housing. With a grounded system only two leads are required to each transmitter; each wheel position transmitter is also wired to the wheel lock switches for that wheel.

NEW PIONEER MAGNETIC PILOTS' COMPASS

THE new Pioneer magnetic pilots' compass, somewhat similar to the Air Corps model B-17, has been designed especially for use on commercial and private airplanes. The unit, designed for panel mounting, is lighted by a standard Pioneer Ringlite bulb projecting through the top of the window. The side of the card carries azimuth graduations in 1° intervals and is visible through a curved glass window which magnifies the card and the fixed vertical lubber line.

To produce stability and freedom from northerly turning and acceleration errors the card is mounted in a moderately large bowl and has somewhat more damping than other pilots' compasses. The period is somewhat longer than that of the model 1808 Pioneer compass. The pivot is fastened firmly in the card and rests on a jewel mounted in a carefully cushioned post for protection against vibration. Ample provision for liquid expansion and contraction permits operation under all conditions of temperature and pressure.

W-E ALL PURPOSE RECEIVER

WESTERN ELECTRIC has just introduced a new radio receiver in which all radio frequency elements together with switches, dial and control knobs are centered in one small housing mounted on the instrument panel within easy reach of the pilot. This unit connects electrically with a second cabinet which may be installed in the after part of the ship and which contains all audio frequency apparatus and the power conversion equipment.

The pilot has a choice of three frequency bands. By operating a rotary switch he may select beacon signals and weather reports; international distress signals and most commercial broadcast bands; and the regular Aviation Communication band. The same switch gives the pilot crystal control on any two previously selected frequencies in the Communication band. Because the navigational value of the beacon signals is impaired by the operation of the automatic volume control, this switch also automatically disconnects this element of the circuit when the receiver is tuned to the beacon band.

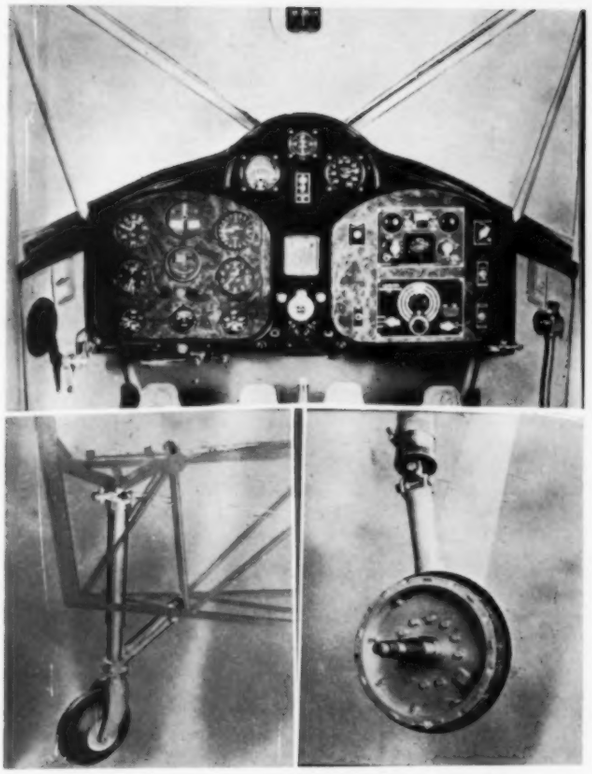
Continuous tuning over a wide band of frequencies is provided by a dial which operates through a 40 to 1 vernier mechanism. Both modulated continuous wave and pure continuous wave type radio telegraph signals may be received. The built-in bent frequency oscillator, for the reception of continuous wave signals, gives the operator or pilot positive control over the pitch of the received tone except when operating with crystal control.

The receiver complete weighs 16 pounds, and no technical experience is necessary for installation. A complete set of vacuum tubes is furnished with the instrument. The radio frequency control-unit weighs four lbs. three ozs., measures 7⅝ in. wide, 5-15/16 in. high, and 4¾ in. deep.

KOLLSMAN DIRECTION INDICATOR

THE Kollsman Instrument Company, Inc., announces the Kollsman Direction Indicator, a new instrument that indicates directions by the movement of a pointer on a dial, and is read like any other panel instrument. The dial, graduated to 2° divisions, corresponds to the compass rose as printed on all aircraft charts. The pointer shows the direction of heading of the airplane in relation to Magnetic North. A reference index with cooperating parallel lines can be set to any desired heading by turning a knob at the bottom of the dial. The compass is fitted with a Kollsman Poly-Plane Compensator which is adjusted by turning the small screws at each side of the knobs.

The instrument was used by Howard Hughes as the master compass on his round-the-world flight. The Kollsman Company reports that orders in hand, both from the U. S. Government and abroad, will absorb the next three or four months' production.



ABOVE: Arrangement of redesigned instrument panel of the 1939 Fairchild "24," showing bulkhead enlargement for 2-way radio equipment and commodious glove compartment. LOWER LEFT: Steerable tail wheel of the new "24." It is full-swiveling as it disengages after passing its fifty degree steering arc. LOWER RIGHT: Hydraulic brakes, redesigned oleo strut and provisions for Airwheels are outstanding features of the 1939 landing gear.

FAIRCHILD "24" FOR 1939

DETAILS of the Fairchild "24" for 1939 have been announced by the Fairchild factory. Without any changes aerodynamically, the new ship has many refinements including highly responsive hydraulic brakes, redesigned oleo strut, and steerable tail wheel, the latter disengaging after passing its fifty degree arc. All of these improvements make for better ground-control, the chief feature of the new model.

Further, a re-design of the engine mount has reduced vibration to a minimum; the cowling on the new model is now conveniently operatable like an auto hood. Extra design strength provides for the installation of Air Wheels.

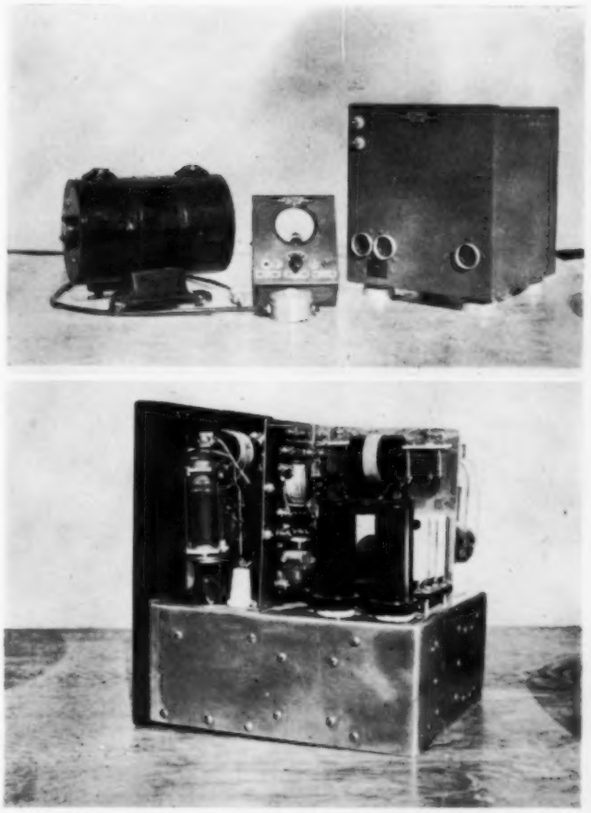
The instrument panel is larger and of finer finish; extra space between the main instrument group and the glove compartment provides for radio receiver and transmitter. A choice of Plexiglass or Safety Glass in the windows may be had. The seats have been re-designed for more roominess and comfort, and again, upholstery color choices may be obtained to blend with exteriors. The ventilation system is arranged so that air is carried from the leading edge of both wings, and expelled at the upper inside corners of the windshield, with a regulating device that permits desired diffusion and directional control. Stewart-Warner gas gauges are now standard equipment.

EARTH INDUCTOR COMPASS

A NEW compass of the earth inductor type is now being made by the Air-Track Mfg. Corp., of Washington. Using the principle of the coil rotating in the earth's magnetic field, the new instrument is applicable for the first time to boat use, and its design has eliminated the faults that have prevented its general use in aircraft. The new compass returns to a proper reading in less than half a second after pitching, rolling, banking and in bumpy air. The compass itself can be remotely mounted in plane or boat, and an airplane type indicator installed on the instrument panel, along with a device for setting the course, a sensitivity control and a switch. The compass may be air-driven for aircraft use. It requires setting only as the plane crosses the lines of magnetic variation of the earth, these lines being about 300 miles apart.

WALLER COMMUNICATOR

THE Spartan School of Aeronautics, Tulsa, Oklahoma, announces its newly developed light weight, high powered aircraft transmitter, designated as the "Waller Communicator." The total weight of the transmitter, complete with dynamotor and cables, is 62 pounds. It is remote controlled, with 3 frequencies, using separate crystals for each frequency; incorporating side tone, interphone, transmission on both long and short antennas; automatic loading on short antenna to prevent overmodulation. It delivers 150 watts into the antenna, 100% modulated, uses class "B" modulation, and the latest type beam tubes in the radio frequency section. With this transmitter, the question of power in aircraft transmitters is now of little importance, and if type A-3 emission is used, radiotelephone third class operator licenses are valid for such station's operation regardless of power.



Spartan 150 Watt Transmitter

This light weight, high powered Waller Communicator has been developed in the radio laboratories of the Spartan School of Aeronautics. Total weight of the transmitter is 62 pounds.

News of the Month in Review

MANUFACTURERS

A. C. C. Production Report

• The Aeronautical Chamber of Commerce has released its production and delivery report of the American aircraft industry covering the period January 1 to October 1, 1938. The report follows:

	Production		Deliveries	
	Units	Value	Units	Value
Commercial airplanes	1612	$ 12,385,759	1651	$ 13,475,971
Military airplanes		42,429,049		42,622,058
Commercial engines	3088	12,197,718	3094	12,211,701
Military engines		15,364,969		15,424,517
Airplane spare parts		18,772,711		18,772,711
Engine spare parts		8,718,874		8,718,874
Total		$109,869,080		$111,225,832

In a statement released by Leighton W. Rogers, ACC president, total 1938 output aggregated approximately 3,675 airplanes of all types which included 150 transports, 300 private and business planes, 1,425 light planes and about 1,800 military craft. Military production now averages about 200 units per month. Rogers also pointed out that if a program demanded 5,500 planes a year the industry could easily handle the assignment.

"Cub" Production New World's Record

• A new world's record for commercial airplane production was established during 1938 by the Piper Aircraft Corporation of Lock Haven, Pa. A total of 737 Cubs were manufactured and sold during the year.

Final compilation of production records showed that for the third successive year the manufacture of "Cubs" had topped all other records for commercial airplane production. In addition, previous figures revealed that for three years previous to 1938, Cub production represented over 25 per cent of total U. S., civil airplane manufacture. While total United States production records for 1938 are not yet available, it is known that Cub production for the year will represent well above 25 per cent of the total.

During 1936, manufacturers of the Piper Cub startled the world by selling 550 "Cubs," a world's record for commercial airplane production, and a figure representing 36 per cent of the United States civilian airplanes manufactured during that year. In 1937, 707 Cubs, nearly 32 per cent of United States civil plane production, were manufactured and sold.

Ryan Expansion Under Way

• An immediate expansion program for the Ryan Aeronautical Company, San Diego, which will continue during the coming year, including enlargement of factory buildings, the installation of a large amount of new manufacturing equipment and increased space for offices and engineering department, has just been announced by T. Claude Ryan, president.

Construction work has already begun on the addition of another floor to the Ryan Administration Building which will provide for the necessary increased executive office facilities and more space for the company's enlarged engineering department. The additional construction includes increasing the tower section of the building to five-story height.

One of the first steps to be taken in the enlargement of the Ryan factory is the construction of two new buildings which will provide an increase of approximately 17,000 square feet of space. Plans are also being drawn for other factory additions. New equipment and tools are to be purchased for the airplane production department, now engaged in the building of Ryan S-T trainers and S-C metal cabin planes, and for the contract manufacturing division, which builds specialized sheet metal parts for other aircraft manufacturers.

Current plans call for the construction and installation of four more Ryan drop-hammers to supplement the five drop-hammers now in constant use on a double shift basis for the production of aircraft sheet metal stampings.

• Ryan has also announced the closing of several new contracts, totaling approximately $95,000, for products of its contract manufacturing division. These contracts call for the production of exhaust collector rings, engine cowlings and other products manufactured by means of the company's specialized sheet metal stamping processes.

These orders are from the Lockheed Aircraft Corp., Douglas Aircraft Co., Consolidated Aircraft Corp. and the Brewster Aeronautical Co., and are for installation on Army bombers, Navy fighters and Navy bombers. Included among the accessories are a quantity of exhaust manifolds for transport bombers being built for the Australian government.

Howard Approves Underwriting

• Officials and directors of the Howard Aircraft Corporation of Chicago have voted final approval of an underwriting contract with Pistell, Wright & Co., Ltd., of New York, covering the offering of an issue of its Common Stock, the proceeds of which are to be used for the purpose of providing the Corporation with added working capital with which to expand its aircraft manufacturing business. Details of the underwriting were not disclosed pending registration with Federal and State securities commissions.

Although changes in the organization set-up of the Corporation have been in process for some months, the directors are at this time formally announcing the appointment of B. D. DeWeese as executive vice-president and general manager. Until recently, Mr. DeWeese was the head of the country's largest builder of feeder line transports and 4-5 place personal transport airplanes.

New Continental Company

• Formation of the Continental Aeronautic Corporation, with authorized capital of $500,000, for the manufacture of airplane instruments and parts, is announced by W. R. Angell, president of Continental Motors Corporation. While not a subsidiary of the Detroit company, which builds the well-known Red Seal aircraft, automobile and industrial engines, the new concern will represent Continental Motors on the Pacific Coast.

Continental Aeronautic Corporation has acquired a 23½ acre site at the corner of Alameda and San Fernando Road, Burbank, California, in the heart of the aircraft industry. Properties include 11 buildings with total floor area of 161,000 square feet. Production equipment of the latest design is being installed and operations are expected to get under way about January 1, 1939. Company will fabricate instruments, accessories and airplane parts for which West Coast aircraft manufacturers have been relying mainly upon distant sources, many as far away as the Atlantic seaboard.

The new company is amply financed and will make no public offering of stock at this time. Officers are: W. R. Angell, president; W. R. Angell, Jr., vice-president; R. M. Allan, secretary and treasurer. Active management of the corporation will be in the hands of Mr. Allan.

Mr. E. J. Rivers will be in charge of production. He brings to the new company 25 years of technical experience, acquired in his association with Army, Navy, Coast Guard and Civil aeronautics. His latest connection was as plant manager for the North American Aviation Corporation. Mr. Allan has been president of the Continental Motors Pacific Company and vice-president of the Gay Engineering Company of California. W. R. Angell, Jr., is head of Continental Motors aviation division in Detroit.

Lockheed Activity Up

• A repeat order from British Airways for two more Lockheed 14 standard transport airplanes was announced December 28, by Carl B. Squier, vice-president. The two planes will cost approximately $220,000. One will be delivered in January and the other in March.

The transports are capable of a top speed of 250 miles per hour and have a non-stop cruising range in excess of 2,000 miles. They carry eleven passengers and a crew of three.

British Airways will use the airliners and six sister ships purchased earlier this year for their daily services between London and Paris and between London and Stockholm.

• The first of 200 reconnaissance bombing planes ordered by the British Air Ministry has satisfactorily completed all tests and has been flown to New York for delivery to London.

The plane met all guarantees in accordance with contract specifications, according to Squadron Leader J. R. Addams, Royal Air Force flying officer in charge of the 200-plane order.

The bomber is a Lockheed B-14 and is painted the camouflage colors of the Royal Air Force. For reconnaissance missions the crew includes a pilot, rear gunner, radio operator and navigator.

• Initial test flights on three 250-mile-an-hour transports ordered by the French Air Ministry are now under way. The planes are the Lockheed 14 type and will be delivered to the government-subsidized airline, "Air Afrique." Cost of the three ships, including engines and standard equipment, is approximately $262,000.

Air Afrique, first French line to purchase Lockheed equipment, is rated among the leading transport companies in France and operates one of the world's longest passenger services.

The route covers approximately 7600 miles and extends from Marseilles through the leading population centers of Africa to Tananarive, Madagascar. Part of the service is operated jointly with the Belgian airline, Sabena.

The new Lockheeds will be equipped to carry eleven passengers and a crew of three. Powered with Pratt and Whitney Hornet engines, they have a top speed of 250 miles an hour and normally cruise at 225 miles per hour. Upon completion of tests at the factory, the planes will be flown to New York and shipped to France. All will be completed this month, Lockheed officials said.

● Lockheed has also announced the sale of two of its ten-passenger transports to the government of Colombia. The planes will be delivered within the next sixty days and will be placed in the service of Saco Airways, a government-subsidized air line and the first Colombian line to operate a regular schedule.

The $125,000 sale is the result of the visit to Washington last week of a mission from the Republic of Colombia. At the capital, the mission—whose government has lately been at odds with the Nazi government of Germany—conferred with State Department officials over the purchase of American airplanes suitable for conversion to military use.

Increased W-E Orders

● Initial orders calling for more than 300 radio marker receivers have been placed with the Western Electric Company by leading airlines, according to H. N. Willets, radio sales engineer of the Company, and approximately 100 additional instruments are being manufactured to meet the demands of itinerant flyers and for the export market.

● American Airlines, through J. G. Flynn, Jr., Communications Superintendent, has ordered standard Western Electric aviation radio telephone equipments for its new fleet of five Douglas DC-3's. The equipments will include 50 watt transmitters, beacon receivers, and a "company" receiver for routine two-way communication. The new ships will also be equipped with the recently developed "marker" receivers that are used as navigation aids under conditions of poor visibility.

Orders have also been placed by Eastern Airlines for radio telephone equipment to be installed aboard the new Douglas transports now under construction for Eastern. The Company has completed negotiations with Braniff Airways for the installation of beacon receivers in all un-equipped ships in its fleet.

Vega Company Buys Factory

● The Vega Airplane Company, subsidiary of Lockheed Aircraft Corporation, has announced the purchase of six and one-half acres of land at Burbank, California, and the manufacturing plant formerly occupied by the Empire China Company. The property is located adjacent to the Lockheed factory and flying field. The factory has 77,000 square feet of floor space and cost $63,650.

According to Mac Short, president of Vega, extensive modernization work which has been in process since Vega occupied the plant some months ago on a rental basis, is nearing completion. Vega at present is utilizing some 40,000 square feet of the plant, the additional space being held in reserve for future expansion.

● Vega has completed a major part of its test program preparatory to rushing completion of the first of its low-wing commercial planes.

Using the Lockheed Altair flying test stand in which was installed a 520 horsepower UNITWIN power plant, factory officials wound up their exhaustive experiments last month by making repeated full load takeoffs with one of the engines completely shut off.

Vernon Dorrell, test pilot, climbed into the cockpit of the test plane after it had been loaded to a gross weight of 5500 pounds. One throttle was sealed shut by Dudley Steele, manager of Union Air Terminal, who served as unofficial observer for the flight.

Using only a single engine, the airplane took off in 1600 feet, circled over the San Fernando Valley and landed without the use of the other engine. The takeoff distance compares with the run of 800 feet which is required when both engines are utilized. Pilot Dorrell reported the ship handled no differently on one engine than on both except that the rate of climb on the single engine was less than on two.

Form National Aircraft Corp.

● A. P. Barrett, pioneer air line founder and widely known Texas financier, announced in Fort Worth recently the formation of the National Aircraft Corporation with an authorized capital stock of $2,000,000. A permit has been granted by the State of Texas to operate within the state and present plans call for early construction of a $100,000 factory, probably near Fort Worth or Dallas, Texas.

The corporation is an outgrowth of the National Aircraft Company of Los Angeles, an engineering concern which has spent approximately three years designing a basic trainer type of airplane convertible into a light attack bomber. The first model of the trainer is now under construction in California pending final decision on factory site and construction.

Officers of the new company are A. P. Barrett, president; J. B. (Jack) Miller, vice-president and general manager; E. W. Zibbell, secretary-treasurer; and Herbert Rawdon, chief engineer.

● Three outstanding cabin airplanes—the famous safety tricycle Model N that makes flying easy ...the luxurious high-performing Model C...and the economical Model S—the complete line for private and business ownership. See your local dealer, or write direct for complete information.

THE WACO AIRCRAFT COMPANY, TROY, OHIO

WACO AIRPLANES

F. W. Seifert

Alfred V. de Forest

Sydney Nesbitt

Miss Willie Peck

PERSONAL NOTES

• Appointment of FRANK W. SEIFERT as midwestern representative of the Ryan Aeronautical Company has just been announced by T. CLAUDE RYAN, president. A pilot and aviation executive of twenty years experience, Seifert will be remembered for his part in the Army's endurance, speed and distance flight of 1923 at Rockwell Field; CAPT. LOWELL H. SMITH (now Major, Air Corps) and LIEUT. JOHN P. RICHTER (now Major, Air Corps) piloted the endurance plane, while Lieut. Seifert and Lieut. Virgil Hines alternated at flying the refueling plane and handling the gasoline hose.

• PROFESSOR ALFRED E. DE FOREST of the Massachusetts Institute of Technology, has received the Sylvanus Albert Reed Award "for the development of a method generally used by the aircraft industry for testing metals magnetically." The award was made at the Honors Night Dinner of the Institute of the Aeronautical Sciences in New York.

• WILLIAM P. LEAR, president of Lear Developments, Inc., has announced the appointment of SYDNEY NESBITT as Sales Manager for the company. Mr. Nesbitt has done considerable broadcasting for several large broadcasting concerns both here and abroad, and was formerly connected with *Canadian Aviation*.

• Braniff Airways has just appointed MISS WILLIE PECK as Chief Hostess on its lines. Miss Peck's duties will be the supervision of hostess personnel, training of new hostesses, preparation of menus and supervision of the airline's food service.

• LIEUT. COMMANDER G. O. NOVILLE has been named director of training at California Flyers School of Aviation, according to NORMAN E. SHERMAN, executive vice-president. Commander Noville was personal aide to Admiral Byrd on his arctic and antarctic expeditions, and was first officer on Admiral Byrd's trans-atlantic flight.

• The Lawrence Sperry Award, given annually by the Institute of the Aeronautical Sciences, has been awarded to RUSSELL C. NEWHOUSE, of Orange, N. J., for his terrain clearance indicator.

• STANLEY A. HEDBERG, formerly with United Aircraft and the Essig Company, has been named Director of Public Relations for the Aviation Manufacturing Corporation.

• Sperry Gyroscope Company has announced the appointment of C. K. WILDMAN as Director of Flight Research. Mr. Wildman was previously technical assistant to the vice-president.

• At a recent meeting of the Board of Director of the Kellett Autogiro Corp. RODERICK O. KELLETT was elected vice-president and RICHARD H. PREWITT was elected vice-president in charge of engineering. ADOLPH C. FALK was appointed chief engineer. Mr. Kellett will retain his office of secretary-treasurer; Mr. Prewitt previously was executive engineer and Mr. Falk was assistant chief engineer.

• LEWIN B. BARRINGER has resigned his position as General Manager of the Soaring Society of America and Editor of *Soaring* to accept a position with a paper manufacturing concern in Newark, N. J.

• FREDERICK FROMME of the Sperry Gyroscope Company presided at the company's 15-Year Club Dinner in Brooklyn recently, honoring thirty-eight employees. President R. E. GILLMOR presented a gold watch or a silver service to each of the honor guests. GEORGE A. LAMBERT was Chairman of the entertainment committee.

• Vega Airplane Company announces the election of CARL B. SQUIER to its Board of Directors. SQUIER is also a vice-president of the Lockheed Aircraft Corporation.

• President C. L. EGTVEDT of the Boeing Aircraft Company, has announced the appointment of ROBERT J. MINSHALL, former vice-president in charge of engineering, to the position of vice-president and assistant general manager, and of the appointment of JAY MORRISON, prominent Seattle banker, as assistant to the president of the company. At the same time, JOHN KYLSTRA was made chief engineer. R. GELZENLICHTER was named production manager, and will head a newly constituted department known as the production and material control department including the production office as well as former functions of the assistant controller's office. Gelzenlichter has been with the company nearly eleven years. CHARLES S. RANKIN was appointed Chief Inspector in charge of the inspection department. FRANK TERDINA was appointed assistant to Minshall.

• Following a special meeting of the board of directors of the B. F. Goodrich Company, ARTHUR B. NEWHALL was elected executive vice-president in full charge of all production and sales. Mr. Newhall has been with the company since 1917.

• Pan American Airways announces the appointment of CAPT. ARTHUR E. LAPORTE to command of PAA's Bermuda Clipper. Meanwhile, CAPT. R. D. D. SULLIVAN has been transferred to Seattle for familiarization with the new 307 Boeing flying boats. Captain LaPorte comes from the trans-Pacific route, where he has flown much of his 450,000 transocean mileage.

Norman E. Sherman and Lt. Com. G. O. Noville

R. C. Newhouse

Stanley A. Hedberg

C. K. Wildman

SCHEDULED AIR TRANSPORT

Record for American

• During 1938 American Airlines, Inc., set a new record for the number of revenue passengers carried in one year. The air line carried 358,295 revenue passengers last year as compared with 300,571 in 1937, or an increase of 19.2 per cent.

Records show that it is an increase of 40.3 per cent over 1936, when American Airlines, Inc., transported 255,324 passengers, and of 103.6 per cent over 1935 when 176.005 revenue passengers were carried.

Revenue passenger miles flown in 1938 also increased, the air line flying 140,869,290 revenue passenger miles last year as compared with 123,047,318 in 1937. This is an increase of 14.5 per cent, 40 per cent greater than 1936 and 117.6 per cent more than 1935.

• American Airlines has just purchased five more Douglas "Flagships" from the Douglas Aircraft Company at a cost of $560,000. This will make a total of ten Douglas ships purchased in recent months, in anticipation of a banner year for 1939 and increased travel to the New York World's Fair and the San Francisco Golden Gate Exposition. The new transports will be placed in service immediately upon delivery. These new purchases will bring American's fleet to a total of nine DST "Skysleepers," with a capacity of fourteen sleeping or twenty-eight day passengers; thirty-one DC-3 "Clubplanes" and fifteen DC-2 14 passenger day planes.

Braniff Plans Expansion

• Braniff Airways, anticipating a large increase in traffic in 1939, has applied for many new routes and has ordered new equipment. Year end reports indicate that 1938 will be the line's most satisfactory year. Passenger revenue for 1938 will be over 25 per cent greater than 1937; mail traffic increased about 10 per cent, while air express increased approximately 17 per cent.

Braniff is applying for 5,597 miles of new routes all of which are located in the central and west central area. The new routes added to Braniff's present system would give a total mileage of 8,308 and would call for more than 20,000 miles of daily flying.

The new routes to be applied for include: Houston-Shreveport-Memphis; New Orleans-Baton Rouge-Shreveport-Tulsa-Wichita-Denver; San Antonio-El Paso; San Antonio-San Angelo-Big Spring-Lubbock-Amarillo-Pueblo-Denver; Denver-Kansas City-Memphis-Atlanta; Denver-Pueblo-La Junta-Garden City-Dodge-City Hutchinson-Wichita-Tulsa-Memphis-Atlanta; Kansas City-Des Moines-Rochester-Minneapolis-St. Paul; Des Moines-St. Louis; Amarillo-Oklahoma City-Tulsa-Memphis-Atlanta.

Braniff has recently purchased two Douglas DC-2's to supplement the present Douglas and Lockheed equipment. A new Stinson Reliant has been purchased and is being made into a "flying laboratory." Completely equipped with three sets of controls for instrument and blind flying, the plane will be the class room of Capt. Ray Shrader, who will give regular advanced instruction and training to Braniff pilots. The company's expansion program also calls for additional flights and sales personnel.

United Completes 25,000th Flight

• United Air Lines' 25,000th scheduled cross-continent flight between New York and California was made Jan. 12 on its regular run. The record represents 66 million miles of coast to coast flying, and 812,117 passengers, 35,648,122 pounds of air mail, and 7,366,149 pounds of air express carried. Compared with the company's first flight some 12 years ago in a Boeing 40-B, 2-passenger mail plane powered with 425 h. p. Pratt & Whitney Wasp, requiring 33 hours and 75 per cent of available power, the record flight was made in a Douglas DC-3 Mainliner, 21-passenger transport powered with two 1200 h. p. Wasps, requiring 16 hours and 50 per cent of available power. In addition United has flown 68 million miles on inter-city and border-to-border trips.

• The new Boise airport was inaugurated by the extension of United's Douglas Mainliner service in that city on Jan. 21. Formerly service was restricted to the 247-D's.

• C. E. Brink, treasurer of United, has resigned his position after 23 years of service, to retire. Mr. Brink became associated with the predecessor company and W. E. Boeing in 1916, becoming treasurer at Seattle and in 1931 assuming the position of treasurer at Chicago in 1931. Norman B. Haley, formerly First Director of the Bureau of Economic Regulation of the CAA and for many years in executive positions with the Interstate Commerce Commission, was named to fill the place left by Mr. Brink.

• United Air Lines' sales plans for 1939 were formulated during a 4 day meeting of United's traffic plan board at Chicago under the supervision of Harold Crary, Vice-President in charge of traffic. Members of the board included: President, W. A. Patterson; Vice-President, Harold Crary; Assistant Vice-President, R. W. Ireland; Sales Manager, B. B. Gragg; Advertising Director, R. E. Johnson; and Regional Traffic Managers, R. F. Ahrens, H. J. Merchant, S. A. Stimpson and J. B. Walker.

America's
FINEST SMALL PLANE ENGINE
OFFERS YOU
• Brilliant PERFORMANCE
• Proved ECONOMY
• Proved DEPENDABILITY
50 H. P.
at 1900 R. P. M.
WGT.—150 LBS.
Continental A-50
AIRCRAFT ENGINE
The Continental A-50 has again won nation-wide fame by its performance in the recent non-stop coast-to-coast flight of 2785 miles.
Averaging 22.3 miles per gallon of gasoline, using only 2 quarts of oil at an average speed of 91 miles per hour and performing perfectly throughout the trip is proof of Continental's leadership in this field.
JOHNNY JONES AND HIS AERONCA on 1st Coast-to-Coast NON-STOP NON-REFUELING SMALL PLANE FLIGHT
The AERONCA on this famous flight on Nov. 29, 1938 was powered with the CONTINENTAL A-50 Engine.
MILEAGE: 2785 FUEL CONSUMED: 125 GALS.
OIL CONSUMED: 2 QTS. AVG. SPEED: 91 M.P.H.
MILES PER GAL.: 22.3 TIME: 30 HRS. 47 MIN.
The Continental A-50 is now standard equipment on the following small planes:
AERONCA—LUSCOMBE—THE CUB—TAYLORCRAFT
Continental Motors Corporation
Aircraft Engine Division
12801 E. JEFFERSON AVENUE • DETROIT, MICHIGAN

C. & S. Enjoys Increased Traffic

● Chicago and Southern announces a 32 per cent increase in passenger miles and a 24 per cent increase in mail pound miles flown during the first eleven months of 1938 as compared with the same period in 1937. Officers of the company predict a similar increase for 1938. President Carlton Putnam said: "The steady surge of traffic during recent months has greatly exceeded our expectations and in all probability will require the operation of an additional schedule daily between Chicago and New Orleans not later than April 1." Putnam said the company was planning to enlarge the equipment to accommodate a 60 per cent increase in passenger capacity within another year. A new route for the company is proposed from St. Louis to Memphis, to connect there with Eastern Airlines, making a link from Minneapolis through St. Louis to the Mississippi Valley and Florida points.

Traffic Heads Organize

● Traffic executives of the domestic air lines have organized a new group to be known as the Air Travel Conference, whose purpose is to promote air travel and to promote cooperation among the major air transport companies of the nation. At the December meeting, the following officers were chosen: Charles A. Rheinstrom of American Airlines, President; D. D. Walker of Chicago and Southern, Vice-President; R. W. Ireland of United, Second Vice-President. The Conference will name an experienced air line executive on a full time basis to be active general manager. Quarterly meetings will be held.

T. W. A. Records 1938 Progress

● T. W. A.'s passenger mile increase in 1938 has been approximately 8 per cent over 1937, and the company anticipates the heaviest air travel in its 12 year history for 1939. Important new improvements in 1938 reported by the line include: a new route to Phoenix, direct service to Boulder City, site of the Boulder Dam, new non-stop flights between New York and Chicago, New York to Pittsburgh, and Pittsburgh to St. Louis. Harrisburg, Pa., was provided with through transcontinental service. The transport fleet was augmented by two new Douglas DST "Skysleepers." For his work in the development of the directional anti-static loop antenna, first used by T. W. A. and now required on all airlines, J. C. Franklin, radio engineer and assistant to President Jack Frye, received the National Air Board Safety Award, for "contributing most to the safety of aviation during the year."

● Important new personnel appointments and promotions in the T. W. A. organization have been announced. V. P. Conroy, former Sales Manager, with 15 years airline traffic experience, has been appointed General Traffic Manager; succeeding Mr. Conroy as Sales Manager will be John C. Graves, for Chicago Traffic Manager for T. W. A. Other promotions include: C. E. Fleming, Assistant to the President; E. A. Hecker, former interline traffic representative, Assistant to the General Traffic Manager; and H. G. Kraft, Assistant to the Vice-President-Treasurer. J. A. Thomas, former New York Traffic Manager of Pan American Airways, has been named Chicago Traffic Manager to succeed Mr. Graves.

● Contemplating a substantial increase in passenger business beginning in March with the Golden Gate Exposition and the New York World's Fair, T. W. A. has purchased three additional "Sky-Club" planes from the Douglas Aircraft Company, at a cost of $350,000.00. This will give the company a total fleet of 36 ships, all of which are Douglas Sky-Clubs, Sky-Sleepers or Skyliners. Additional passenger service will be given to Philadelphia, San Francisco, Los Angeles, Kansas City, Chicago, and New York City.

MISCELLANY

Humble Creates Credit System

● Extension of a national credit arrangement to the aviation market has been announced by a group of outstanding petroleum marketers.

In the southern district, companies cooperating in the plan are Humble Oil and Refining Company, Standard Oil Company of Louisiana, and Standard Oil Company of Kentucky.

Last year for the convenience of their customers sixteen major oil companies inaugurated a national credit card plan for motorists. The plan met with instant success over the country, and now the cooperating companies are extending the nation-wide credit privilege to fliers.

Pilots holding Humble cards have the credit convenience not only in Humble's marketing territory of Texas, but in all 48 states. On the other hand, customers of companies marketing in other sections may make credit purchases at Humble stations throughout Texas.

The plan has many advantages for pilots. A credit card issued by any of the companies will be honored from coast to coast. The large number of airport dealers of each company gives intensive coverage over the nation.

Not only may the pilot find a convenient airport dealer at practically every major airport in the country, but he is assured of the highest quality aviation gasolines, engine oils, and greases. These marketers were selected because of their reputation for excellence of service and merchandise.

If a pilot makes credit purchasers from several of these companies during a month, he receives only a single monthly statement covering all charges, this from the company issuing his credit card.

In addition, use of the national credit plan eliminates the necessity for carrying large amounts of cash on long flights and gives a check on the operating costs of the airplane.

National Aviation Congress Announced

● Announcement of a joint nation-wide educational program to place the aviation needs of the country before the public and their legislative representatives was made at a meeting at Washington, D. C., December 19th, at which were present sixty representatives and observers from thirty-five state and national organizations interested in aviation. Initial activity will be the holding of a national aeronautic congress at the nation's capital on February 20th and 21st, 1938.

Leaders from the American Legion, the U. S. Chamber of Commerce, the American Federation of Labor, the Veterans of Foreign Wars, the American Municipal Association, the C. I. O., the National Exchange Club, Kiwanis and Zonta International, the International Organization of Chiefs of Police, the U. S. Conference of Mayors, the National Association of Broadcasters, Disabled American Veterans' Association and the Daughters of the American Revolution, in attendance at the meeting, indicated that they would lend their assistance in developing the cooperation of their organizations in the joint program.

The meeting was called by the National Aeronautic Council, a permanent aviation coordinating committee comprised of leaders from the National Association of State Aviation Officials, the Air Reserve Association, the Aeronautical Chamber of Commerce, the National Aeronautic Association, the Seaplane Flying Association, the Air Transport Association, the Private Flyers' Association and the Air Reserve Association. The nation's aviation needs as drafted by this joint committee of leading aviation authorities, will be presented in detail at the February conference. On December 17th next year, the anniversary date of the first airplane flight, all aviation organizations, private flyers, government air departments and national, state and local organizations interested in flying will be asked to join in a nation-wide presentation of air progress and aviation needs.

The National Aeronautic Council was formed early this year as the result of action by the First National Aeronautic Conference, endorsing the establishment of such a permanent coordinating committee. W. H. Enyart, Secretary of N. A. A., serves as Secretary of the Council.

The chairman of each of the five regional aviation conferences held during the past year, will assist in the organization of the February national conference at Washington. Invitations to participate in the conference will be extended to all state and national organizations believed to have interest in aviation. Speakers will include leaders in aviation from industry and the government.

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Combat Squadrons

(Continued from Page 12)

REGARDING combat airplane strength of the air force, General Andrews provided the enlightening information that the present numerical airplane strength of tactical army air units in the continental limits of the United States is not 2,000 or 3,000 and 4,000 as popularly believed but a scant bit over 400. By these he means fighting planes, such as attack, pursuit and bombardment, which, after all, are the only planes which would deliver the fire power of the air force. Orders now being filled by manufacturers are expected by General Andrews to boost this total to 630, which is still a long way from the present authorized air force strength of 980.

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Aviation—1939

STIMULATED by the President's rearmament program and the progressive policies of the new Civil Aeronautics Authority, the entire aviation industry can look forward with assurance to the greatest year of activity in its history. Aircraft production, engine and accessory manufacture, flying school operations, airline transportation and private flying should hit all-time peaks during the next twelve months.

—T. Claude Ryan, President
Ryan Aeronautical Company

Ports of Call

Correspondence from the Airports and Airways

Brownsville, Texas

Dance Held Honoring Golf Trophy Winners
Eastern Investigating Fields on Houston-Brownsville Run

Braniff Airways maintained a very interesting booth at the Valley Mid-Winter Fair held annually in Harlingen. One of their very attractive hostesses was in charge to distribute various airline literature and answer all questions.

Pan American Airways employees held a dance recently in honor of Santos Ceyanes of the Accounting Department, 1938's winner of the Balluder Golf Trophy, and Mrs. Dorothy Peak of Maintenance, winner of the Johnson Trophy for women of PAA. The Balluder trophy is offered annually by Mr. Edwin Balluder, general manager Western Division of PAA, and the Johnson trophy is offered by Mr. and Mrs. G. W. Johnson, Sp. Exec. Rep. Western Division of PAA. Competition for these cups is very keen and in order to get permanent possession one must win it three years in succession. So far there have been no three-time winners, in fact, no champ has repeated the second year up to now.

Eastern Airlines have been sending their pilots over the Houston-Brownsville route quite often during the past few weeks in order that they may familiarize themselves with all fields, emergency, etc., in preparation for the opening of service on the above mentioned route by EAL in the near future.

Some of the boys in the overhaul shops of PAA are imagining themselves young again and have organized a football team and sent out several challenges. If the way they carry themselves around the day after a practice is any kind of a sign, they better pray for no acceptances.

Pilots Sarabia and Estrada passed through Brownsville enroute to Mexico with a used Pilgrim and a Bellanca to be used on Pilot Sarabia's airline in Mexico.

Pilot Bibbe and party, of Canada, cleared through Brownsville for Mexico City in a Canadian Fairchild. The trip was just a pleasure jaunt from Canada to Mexico and return.

Our Raymondville friend, Gorman Fox, passed through here in his new Cessna bound for Mexico on a hunting trip. We suspect his first hunting was for a place to land after he reached the ranch he was going to hunt on.

The Stinsons seem to have it this month among those visiting the local airport. Pilot Roy Harding, Texas Company; Pilot C. O. Bell, Goodyear Tire and Rubber Co.; Buck Rowe, Gulf Company; and Les Mauldin, Mauldin Airport all came through in Stinsons.—*G. G. BEVIL.*

Coffeyville, Kansas

New Aviation Club Formed
Several New Solo Students

Billy Hagerty has become the youngest pilot in Coffeyville. He has been ready to solo for sometime, but had to wait until he reached the age of 16 before going ahead. On his sixteenth birthday he soloed

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the Coffeyville Airways American Eagle and handled it like a veteran.

Authorization by the C. A. A. to light the Tulsa-Kansas City airway climaxes a fight of several years duration by airmen in those two cities and the towns in between. Mid-Continent Airlines are at present operating a night flight over this route only by special permit, making it the only night air route in the world to operate without beacon lights. Work is to start immediately on the nine beacons which are to be installed. Charles Horan, William F. Luce and Daniel F. Cassidy were here recently surveying locations and leasing ground for the beacons.

Lloyd Medsker has purchased an Aeronca-50 from Perry Markley of McCune, Kansas. This makes the third locally owned Aeronca.

The Aviation Club is the name of the organization recently formed by local air enthusiasts. Meetings are held every other Friday night. Every third meeting is a social meeting while the other two meetings are devoted to study. Officers of the club are: Howard Megredy, president; Ray Jensen, vice-president; Miss Glenna Holt, secretary; Mrs. Sally Duncan, treasurer; and Mrs. Opal Ferguson, corresponding secretary.

Ray Jensen, accompanied by Mr. and Mrs. Bill Jensen flew to Kilgore, Texas, in the Jensen Bros. Waco N. From Kilgore the Bill Jensens took a train to New Orleans where they boarded a steamer for South America and a three months business trip.

Inspector H. F. Illich was in from Wichita in his Fairchild and renewed Lee Ferguson's L. C., and Llyn Berentz and Rolly Inman's Transport licenses.

Al Streator becomes the twenty-ninth student to solo the Duncan Aeronca since last summer.—*HAROLD E. HAGGARD.*

Dallas, Texas

Many Local Pilots Attended the Miami Air Maneuvers
Airplane Sales Still Active in Spite of Numerous Vacations

Hart Bowman, superintendent of Dallas Aviation School and one of the best liked men in the industry, recently combined his first vacation in five years with a business trip to the middle west. Hart spent a great deal of time inspecting all the flying schools in that territory.

Don Marshall of Lockheed with Mrs. Marshall has also been vacationing in California where they helped ring in the New Year. Don left at this writing with Carl Squier for a combined business and hunting trip in Mexico so we will have to wait until next month to report the results.

Among the lucky ones that took off for the All American Air Races at Miami, Florida, were Hal and Polly Henning, Ben Bransom with Jack Burrus, Jean Larene and Lou Foote, and Bob and Mrs. LeSage. The LeSages are going to extend their holiday to a trip in Havana.

Santa Claus in the persons of Pop Harmon and Bill Long gave the boys at Dallas Aviation School a long Christmas vacation in order to permit those who lived great distances plenty of time. The school closed December 17th and opened January 2nd.

Jim Allison has moved to Houston where he has taken a job flying for Mr. Hull of the Texas Pipe Line Company. Buena Fortuna!

Two new Stinsons were sold last month through Booth-Henning, Inc.—one to Braniff Airways and one to R. P. Smith of Port Arthur.

Carl Walrath, the likable Aeronca dealer of San Antonio, took his instrument rating at Dallas Aviation School and now is flying as co-pilot on Braniff Airways, Love Field.

All these vacations seem to have interferred with our news sleuthing so until next time—smooth landings.—*DOROTHY G. RODREICK.*

Glendale, California

Doug Corrigan Recent Visitor
Many View Tournament of Roses from Air

Two new members were added to the Grand Central Flying School staff recently. They are Miss Nita Sherman of Kellogg, Idaho, who is secretary to Charles A. Zweng, who is getting out a series of texts covering instructor and instrument ratings and Miss Jennie Cook of Denver, Colo., who is a new assistant to Joe Plosser.

New instrument students are: R. C. "Skeets" Barker, chief pilot for Manning & Martin, Inc., of Denver; Bill Murphy of Glendale; Johnny Wagner, test pilot for Vultee Aircraft; and Clau Coe, Visalia, Calif. Some of the new flying students are: Tom and Jack Duffy from the state of Washington; Tony Mace (who played in the picture "Robin Hood"); Lou Landers, RKO director; Jose 'Iturbi, international concert pianist; Len Dure; Dave Bohannan; W. W. Bartlett and Claire Dodd, the movie actress.

Tom Duffy and Jimmy Mueir acquired their solo licenses last week.

Week-end visitors were: Leo Seaman and Dr. Joseph M. Greer of Phoenix, Ariz.

There were many enjoyable sightseeing trips made over Pasadena to see the annual Tournament of the Roses and the Rose Bowl football game.—*MAXINE SEARLE.*

Houston, Texas

New Administration Building Started
Many Visitors to Shreveport Demonstration

Mayor R. H. Fonville turned the first shovelful of dirt starting the construction of the new $125,000 Administration Building. It will be a three story building of brick with tile floors—74 by 168 feet overall. The ground floor will house the waiting room, a large modern coffee shop and lunch room, airline ticket and officials offices, baggage and mail rooms. The second floor will be a promenade deck for patrons and will accommodate the weather bureau and radio offices. The third floor is the observation tower and control quarters.

The list of bachelors at the Houston Municipal Airport is gradually waning. Mr. H. C. Winborn and Jack Snyder recently took the vows.

Bill Moores, Texas Company pilot, has been transferred from Houston to Houma, Louisiana, to fly their new Grumman Amphibian. Jim Allison, formerly of Dallas, has taken Bill's place as pilot of the Wasp Stinson.

Miss Evelyn Ruth Turner, cute telephone company information girl, made her first solo in Air Activities' new "50" Taylorcraft and since has been building up her solo time rapidly.

Mr. and Mrs. J. D. Reed, Mr. and Mrs. Bill Scott, Mr. Charlie Scholes, Mr. Jimmie Michael and Mr. Jiggs Murray reported having a very enjoyable time at the Shreveport Aircraft Demonstration Meet.

Bob Hunt has just returned from Alliance with a new Taylorcraft "50" for use in Air Activities' School.

The reason for the big grin on Bud Gillie's face is that his boss, George Echols, has just bought him a new Howard.—*BOB HUNT.*

Joplin, Missouri

Many New Airplanes and Students This Month

Don Blazer of Pittsburg, Kansas, has just been added to the staff of Harper Aircraft Co. He is especially competent, holding both a transport and an A and E license.

F. I. Blosser, J. E. Edison, Mr. Eastridge, Mr. Klingman and Bob Wilson are still doing considerable flying in spite of the rumored weather. Jack Allan and Mickey Spicer have just soloed.

Joe Hooker who travels for the National Cash Register Co. and currently headquarters here, has made the old struts sing these past few weeks. Glad to see you in the air again Joe.

Milo Jackson and Marvin Hill of Carthage have just acquired a Velie Monocoupe and Herschel Yost has an Arrow Sport. Everett Dyer, also of Carthage, Mo., has purchased a Travelair and has just got his solo rating.

O. K. Southwick of Springfield has stored his tri-motor in Joplin for the winter. Glen Miller, of Des Moines, Iowa, has his Alexander in the repair shop for the present.

Harry Adams made a hurried trip in a Cub "50" to Joplin from Savannah, Ga., where he is now located, but his little daughter had beaten him here.

More new students are: John Riseling, Harry Bastine, Leonard Cale and Gene St. John.

Transients recently were: J. B. Walker in a Monocoupe, T. R. Young in a Cessna, Mr. White of Pittsburg, Kansas, in a Waco Cabin, Arch McGregor in an Aeronca, W. L. Ulmer, formerly of Joplin who is now located with KTUL radio station in Tulsa, Oklahoma, flying a Curtis Robin, J. O. Tipton in a Beechcraft belonging to Crabtree Oil Co., Mr. Murdock, a Wichita publisher in a Cessna, W. T. Saxon also in a Cessna and Robert Jacquet of Chula Vista, Calif., in a Waco Cabin.—*HELEN HARPER.*

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Jackson, Mississippi

New Weather Bureau at Airport
Several New Year Visitors Enroute to Miami

The northeast-southwest runway was opened the last of 1938, so Jackson now has two paved runways 3000 feet long. The surface of the northwest-southeast runway was given a non-skid finish.

The Department of Agriculture is putting in a weather bureau at the Jackson Airport and John Alden, former head of the old weather bureau, will be in charge.

Fourteen planes spent New Year's night here. They were enroute to the Air Maneuvers in Miami.

B. J. Banier from Yozoo City passed his solo rating in time to join the caravan to Miami in his Cub.

Recent visitors to the airport were Mr. and Mrs. Hal Henning, Andy Anderson, Arch McGregor, A. B. Lambert, Jr., Geo. A. Hales, Buck Carter and Andy Gipson.—*BUD MOORE.*

Marshall, Texas

Air Traffic Increased 50% Over Previous Year
Airport Host to Miami Convoy

"It was a great year," says J. O. Womack, airport manager of 1938. Air traffic through Marshall showed a 50 per cent increase over 1937. The Marshall Flying Service enjoyed its biggest year since it was established four years ago. When the plans now being formulated are released, Marshall can get set for another bigger and better year of flying.

The personnel of the Marshall Flying Service shop has been hampered by sickness. As soon as Jimmie Cummings, Marshall's ace mechanic, had recuperated sufficiently from a two weeks illness to report for duty, Shop Manager Dick Craig was forced down with chills and fever. Barton "Pride of Jefferson" Robertson and J. O. Womack, the remaining members of the quartet, are nursing colds via Kleenex and cold tablets. Here's hoping you all are on the road to recovery soon.

On New Year's Day the airport was host to a convoy of light planes enroute to the mid-winter air show in Miami. Among the planes and pilots seen on the field were: Cliff Stovall of Shreveport and E. T. Crawford of Timpson in a Cub 50; Muzzy in Stuart's Luscombe from Kilgore; Joe Messina of Shreveport in "Wahoo" Shreveport's Cub of distinction; George Hearne also of Shreveport in his new Aeronca 50 Deluxe; Dr. Tom Connors and his father in his Rearwin, flat tire and all; Tom Breedlove of Lubbock in a new Taylorcraft; V. S. Enloe and Jack Potter of Kilgore in a Cub; Lou Foote and Rolfe Carlisle of Dallas in a snappy Franklin Cub; M. F. Dagley of Lubbock in a Cub; Johnnie Erickson and Ed Wilson of Ponca City in a Cub; and Herb Brokey of Ponca City in a Cub. After a short "Gab and Gas" session, Buck Rowe led his "No-Nox" charges off toward Monroe, La., and the air maneuvers. About two hundred people were on hand to wish them bon-voyage.

Robert Talley, the flying undertaker, can be seen almost every day joy riding in his new Aeronca 50. He recently returned from a trip to Waco.

Cadet William Lane, Jr., of Kelly Field was a welcome visitor in Marshall during the holidays. Bill is one of the twenty-seven Texans in the Air Corps advanced training school at Kelly Field due to graduate in February.—*V. G. PROVENZ.*

New Orleans, Louisiana

Aviation Observation Squadron Proposed
New Passenger Service Between N. O. and Jacksonville

There is a possibility that an aviation observation squadron will be established at New Orleans in conjunction with the Louisiana National Guard, Major-General Albert H. Blanding, chief of the National Guard Bureau in Washington, intimated while visiting in the Crescent City during December.

Impressed with the facilities offered at Jackson Barracks and Shushan Airport for such a unit, Major-General Blanding declared that although other factors outside the National Guard entered into the matter, he felt there was "a good chance" for a squadron to be stationed in the city. He pointed out, however, that any move for its location in New Orleans must originate with Congress and the War Department, and not with the National Guard Bureau. He foresaw a possibility of favorable reception because the president has proved

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IN THE SOUTHWEST BRANIFF AND AMERICAN AIRLINES USE HUMBLE AVIATION GASOLINE

interested in national defense projects.

Location of such a squadron here would mean a group of 150 enlisted men, 30 pilots, nine to fourteen planes and observation and photographic equipment would be created. "Our opinion is that the National Guard could adequately handle all observation within the boundaries of the United States, leaving the regular army to handle the more difficult phases of combat aviation," Adjutant-General Raymond H. Fleming, head of the Louisiana National Guard, explained. "We also feel that the mouth of the Mississippi river should be protected."

An application for an observation squadron from the Louisiana organization has been on file for about ten years, but conditions have never before seemed propitious for its realization.

A system of 130 lights, rated A-1 according to standards set by the National Bureau of Aeronautics, is now in operation at Shushan Airport, constructed at a cost of $12,000 by WPA labor and with Orleans Levee Board material. The levee board owns and operates the airport.

The project included rearranging existing lights, installing others and elevating light standards on the seawall end of the field.

The Aeronautics Bureau of the Young Men's Business Club is seeking to prevent the reported impending closing of Alvin Callender Field on the Belle Chasse highway, New Orleans' first landing field, now maintained in an auxiliary status. The committee is sustained by Douglas O. Langstaff, state director of aviation, in its belief that a need exists for this emergency facility at New Orleans.

It is reported that an oil company has purchased the site.

National Air Lines of St. Petersburg, Inc., which has been operating an airmail service between New Orleans and Jacksonville, Florida, since November 1st, recently inaugurated passenger service on the route. There is one flight daily.—*P. J. RINDERLE.*

Oklahoma City, Oklahoma

Several New Airplanes During Past Month
Air Marking Program Nearing Completion

Two new Cessna C-39 Airmasters have joined the ranks here at Municipal Airport. George Hales is the proud owner of one in which he says he has everything but a shower bath. Mr. Hales is leaving for California with his right-hand man and co-pilot, Lee Armstrong. He has just returned from a trip to Pensacola, Florida.

Carl Winstead celebrated the holidays by taking delivery on a brand new baby girl and a new C-39 Cessna. Dena Lu Winstead arrived December 23rd to bring a bit of cheer at Christmas and on December 31st Carl brought in his new Cessna to start the New Year. He left immediately for Miami, where he attended the Orange Bowl game and entered the Air Races.

J. Sydney Maxfield has been missing from the airport here lately. Sydney says he has to fly between meals now.

L. T. Dutcher can be seen on the field with Stooge, his mascot, at his heels.

J. Haskell Bethurum has purchased an Inland Sport which is now hangared at Municipal. He is a new man on the field. Welcome, Haskell!

Herbert Howell, president of the Aviation Club, was disturbed early New Year's Day for a story on the Club's air marking program which is nearing completion and which has created considerable interest.

Your correspondent who is now working on a seismograph party headquartering in Oklahoma City can't quite quit aviation entirely. He is back flying again and just before Christmas made a Santa Claus parachute jump for the children in Lawton, Oklahoma. This was his fifth such jump.

The airport is proud to have six Cessnas, ranging from C-34's to C-39's, with two more expected.

Southwest Aviation & Service Company reports their student business on the up and up. Norman Blake is still on the sick list.

Byron Susan and Byron Savage, the flying Byrons, are having their Monocoupe completely rebuilt.

Charley Brogan is again flying his "pride and joy"—the Blue Streak open Waco. He sold it to Lief Olson in Shawnee and bought himself a cabin Waco. Now Charley and Lief have traded ships and both are satisfied and happy again.—*PAUL O. BLACK.*

Phoenix, Arizona

Dinner Party Honors European Air Traveler

Bessie Owens and Ethel and Bill Shebe spent the week-end here recently so the Phoenix Flying Club decided that their visit was a very good excuse for having a dinner dance. During the evening Bessie showed the pictures which she took while on her flight across Europe and Asia. We all think Bessie and the Shehes are pretty nice people and hope that they pay us another visit soon.

Harold Lines, Pete Volcheff, Delbert Poe and Marshall Stewart all have Private Licenses; Jack Marine and Mel Burton have their Instructor's Ratings; and Bill McNeilley and Sanders Watson are the most recent solos in town.—*RUTH CHALMERS.*

San Antonio, Texas

Expansion of Stinson Field Into Class Four Port Reported
Fred Harmon Back on the Job

Included in the program recommended to Congress by the CAA recently, according to reports from Washington, were indications that Stinson Field would be expanded into a Class 4 airport with four runways 5000 feet long. At present the field has one runway that measures up to the requirements of 150 feet in width and 5000 feet long, with a second runway the same width but only 4500 feet long. Two additional runways will have to be constructed to make this a Class 4 port. Eighteen other Texas airports may be included in the expansion program.

A recent visitor here was Robert C. Reeve who is being entertained at the home of George Cowden of Pearsall. Reeve operates two Fairchild airplanes in Valdez, Alaska. Some of his duties are hauling gold from mines in the interior, making aerial photographs and just flying in general. Recently his motor failed at 15,000 feet over Mount Wrangell. He glided down the side of the mountain and landed in a canyon, then had to walk home—a mere 150 miles with the temperature between 40 and 50 degrees below bero. Reeve says there are now 150 airplanes and 75 pilots in Alaska. All planes are equipped with skies the year around due to the ice and snow on the ground. However, sometimes during the warmer part of the summer they take off in mud.

Frank Eng and Dick Hair have been having lots of fun setting records locally for slow flying and slower landing in the former's Pitcairn autogiro. They are little concerned with the plan for the new 5000 foot runways, as all they need is 50 feet.

Some competition has been afforded the autogiro by the Stearman-Hammond which recently came here from Midland for overhaul. Builders of the latter plane claim all the safety factors of the autogiro and say it can be flown by inexperienced pilots as well.

The air corps still swears by its big B-17 "flying fortresses." In spite of the criticism of sceptics when the ships were delivered at Langley field, the accident rate has not been higher and the bombers are not too difficult for the average pilot to handle.

Installation of border lights around the new addition to Stinson field have been completed.

Fred Harman is back in harness again, if only for a few minutes each day. Aside from a scar on his forehead and a leg in a cast, he is none the worse for wear after his accident—in an automobile,—mind you. It will probably be a month before he can remove the cast from his leg, but one thing sure, he is more thoroughly convinced of the safety of air transportation now. Mrs. Harmond has also returned home and is recovering nicely.

Saul Wolff, salesman for Smith Motor Sales Company, has turned his enthusiasm for aviation to good advantage, having organized a flying "squadron" in his store. Along with his son, Sam, two other fellow employes are learning to fly. William E. Brown, Manuel Chavez and the Wolffs are taking instruction from Paul Daily at United Aero Corp. hangar.

Col. J. H. Lapham, together with other officials of the Texas Company and the Socony-Vacuum Company are on their way to Columbia, South America, to inspect a pipe line being built jointly by the two companies.

Two new taxi strips, one at the center of the field to the north-south runway and the other along the end of the field are being installed by WPA workmen.

Eastern Air Lines has added S. B. Allen to its permanent force here. He will be transportation agent at Stinson field.

Mrs. Lucy Jane Foster, secretary for Hangar Six, isn't particularly pleased with the climate in Pennsylvania. She went home to visit her parents at Oil City at Christmas time and didn't get home until a week after New Years. She believes she will stay in San Antonio during the winter months after this.

Four new students enrolled at Dick Hair's Modern Air Travel Corp. recently. They are Silvio Fack, Ira Purdon, E. R. Montoya and W. H. Perry.

Jack Cunningham soloed recently and his wife, Mrs. Loretta Wolf Cunningham, already a private pilot, took her first solo in a Fleet.

Al Buchanan and his daughter, Hortense, took off for New York in their Beechcraft recently with Bill Cason at the controls.

M. F. Clark was kept busy inspecting more than half a dozen planes on his last monthly visit.

Fred Achor has left for the factory at Lock Haven, Pa., to take delivery on another Cub Sport for Hangar Six.

Stamford, Texas

New Field Being Constructed by City
Stamford Flying Club Progressing Rapidly

The Stamford Flying Club which has just recently been organized now boasts of nine members and is progressing nicely. Instructions are being given on a 40 h.p. Continental Taylorcraft.

The city has leased a fine field three miles north of Stamford and

(Continued on Page 26)

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FOR SALE: DeLuxe Rearwin Sportster, many extras. Perfect condtion. Few hours. A steal at $1850. Tom A. Lochridge, Rosharon, Texas.

FOR SALE: EAGLEROCK fuselage, complete, $75. Three OX-5 engines good condition, only $20 each. One Fahlin Propeller for OX-5, $15. Bill Garrett, Box 788, Graham, Texas.

AERONCA LOW WING: All blind flying instruments, special paint job green and yellow, 90 hp. LeBlond motor in perfect condition. Looks like new. Total time only 243 hours. T. R. (Ted) Young, Box 674, Shreveport, Louisiana.

FOR SALE: SALMSON EAGLET. New cover. Few Hours. Stuart Holmes, Box 764, Taylor, Texas.

FOR SALE: STINSON S, 215 Lycoming powered, motor and ship in excellent condition, cover like new, radio, navigation lights, all necessary instruments. $1400. Box 101, Southern Flight, Ledger Bldg., Fort Worth, Texas.

FOR SALE: Mounted Steer Horns, five to seven feet spread, fine decoration for home, office or Texas planes. Free photo on request. Lee Bertillion, Mineola, Texas.

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WACO, 1935 Custom, Wright 285 Motor; total time 300 hours, fully equipped, 95-gallon gas tanks	$3300.00
STINSON, 1936, Lycoming 245, controllable prop, completely equipped	$4500.00
STINSON, 1936, Wright 285, fully equipped, corrosion proofed	$6300.00
STINSON, 1936, Wright 320, fully equipped, corrosion proofed—as land plane	$7000.00
as sea plane	$9000.00
STINSON, 1934, Lycoming 245	$2700.00
STINSON, 1933, Lycoming 225, completely equipped	$2250.00
BEECH, 1937, Jacobs 285, fully equipped	$6300.00
BEECH, 1936, Jacobs 285, corrosion proofed, extra door, fully equipped—as land plane	$7000.00
—as sea plane	$9000.00
KINNER SPORTSTER, Kinner 125, standard equipment, 210 hours since major	$1600.00
ARROW SPORTSTER, 1937, Ford V-8 motor, only 70 hours total time, modernized	$800.00
WACO N, 1938, Jacobs 285, almost new	$7500.00
WACO, 1935, Custom, Jacobs 225	$2900.00

Above cabins nearly all have complete blind flying equipment, including 2-way radio, and in nearly every case, motors have just been overhauled. All are in excellent condition. Complete information on request.

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1936 Cub, motor just majored	$750.
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ARROW SPORT '37 Deluxe gullwing, 161 hrs. Lights, tail wheel $900

BEECHCRAFT '36 Jacobs 285 hp. 2-way radio, B-F and night instrs., sensitive altimeter. Total time on new engine 26 hrs. $6750

BEECHCRAFT 420 Wright. Perfect Condition. All instrs. $6750

BEECHCRAFT Wasp Jr. 450 hp. Total 100 hrs. Horizon, gyro compass, two-way radio, all instrs., 4 parachutes, night equipment $15850

CESSNA 1936, 145 Warner, special instruments and equipment $3500

CUB '36 Model. Color gold. Just relicensed. Perfect condition $850

FAIRCHILD '34 Model 24 Warner 145 hp. Bank and turn, rate of climb, RCA receiver, wheel pants $2500

HOWARD 1937 DGA-8, 320 Wright, Sperry insts., 2-way radio, night flying equip., perfect condition $7900

ROBIN, Challenger engine. Color red. Engine majored, relicensed $750

RYAN SC Warner 145 hp. Demonstrator. Like new $5000

SPARTAN J6-5 engine. Cover perfect. Cowling ring, steel prop, dual, rate of climb, bank and turn, compass, airspeed, altimeter $900

STINSON '34 Lycoming 245 hp. 100 hrs. since major. Recovered. Starter, generator, lights, radio, B-F instrs., controllable prop $2950

STINSON 1938, 320 Wright, no time since factory overhaul, special job, blind and night flying, Ham. Cont. Prop. $7500

STINSON Lycoming 215 hp. Ship and engine perfect condition $1400

WACO J-5 Open, 3-place. New Cover. 85 hrs. since major. Military windshield, sensitive alt., starter, gen., 850 x 10 wheels $1350

WACO AMBULANCE 36 285 Wright, radio compass, transmitter, Hamilton con. prop., exceptionally fine $5750

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LOVE FIELD · DALLAS, TEXAS

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Ports of Call

(Continued from Page 24)

has already dragged two runways. The rest of the field is under construction as is a hangar.

Harvey Harrel has a deluxe Arrow Sport in which he is doing considerable flying.

Roy Taylor, a dealer for Aeronca, came through a short time ago and gave several demonstration flights to students.

Tampa, Florida

Former Air Enthusiast Now Uses Plane for Business
First Airline Celebrated This Month

Herb Weiss, West Coast Division Manager of Schenley Products, recently had a rush order from a distributor some distance from Tampa. For years Herb has been an aviation enthusiast, so when Chuck Hoenes, one of the operators on the Peter O. Knight Airport, suggested flying the crates of liquor there, he jumped at the idea. It proved so successful that Herb is now learning to fly so that he can do his own delivering in the near future. We hope that his "brand" is so popular that he can put in many, many hours.

The first flight of the original scheduled airline in the world which started here was dramatized on a national hook-up from Washington by Mr. Paul E. Garber, Assistant Curator, Section of Aeronautics, Smithsonian Institute, on the "World Is Yours" program.

Tampa and St. Petersburg also had local celebrations at that time. The Tampa Chapter of the NAA unveiled a series of murals depicting man's dreams of flight from the fabled Iccarus in the Tony Jannus Memorial Administration Building on Peter O. Knight Airport. It is also a coincidence that the Benoist Airboat used on this first airline was built by Tom Benoist in the City of St. Louis, Mo., where the NAA held its convention on the 25th anniversary of scheduled commercial aviation.—*R. E. BURRITT.*

Savannah, Georgia

Night Stop-over of Light Plane Convoy
Gas Model Planes Stage Air Contests

More than 200 light planes convened here for a night stop-over enroute to the Miami Air Maneuvers. They were entertained with a dinner and dance at Hotel De Soto which was planned by "Sandy" Strachan. Several local pilots joined the cavalcade here. Among them: Sandy Strachan, Jr., Joseph Perelstine, Ben Gunn, Miss Betty Allen, Miss Alberta Barber, Steve Sennett, A. P. Solomon, III, and Henry I .Coleman. They were one section of convoys totaling 500 from all parts of the country.

The Sportsman Pilot Association, Inc., of Washington is planning to spend two or three days in Savannah for their annual winter cruise and rendezvous. H. P. Cole, state governor of the association, will be here to greet the pilots. Between 45 and 100 planes are expected on January 20th.

Randy Enslow, accompanied by his mechanic, Mr. Anderson, stopped off here to visit his brother, Capt. Wilder Enslow, enroute to South America. Randy and Capt. Enslow had lunch with Mrs. Enslow before the former deported on his long trip. Capt. Wilder Enslow has been well known here for many years as an "old timer" in the flying business.

Robert Muse, 16 year old Savannahian, recently made his first solo.

Ben Gunn, formerly with Piper Aircraft Company of Lock Haven, Pa., has just accepted a position with Strachan Skyways, Inc., as sales and public relations director.

Strachan Skyways are moving their ground school into town from the airport so that the public may drop in on the classes at will. They hope this will stimulate more interest in flying by the general public. They are also offering a flying lesson to anyone who wishes to ride for one dollar. The student will actually be permitted to control the ship on the first ride. This should also help create interest.

Competitors from Charleston, Jacksonville, and Savannah met here for a gas model plane meet at Municipal Airport under the auspices of the Exchange Club. "Smikel," the gas model plane of A. C. Ross of Savannah won first place in the 30-second engine run and duration contest. It averaged two minutes and 48½ seconds in the air, one flight being four minutes and fourteen seconds.

The 45-seconds open contest was won by J. C. Schwarz, Jr., his plane staying up five minutes and 55 seconds in two flights. These two boys tied for first place, and will have a run off.—*LYDIA MUSE BETTENCOURT.*

Tulsa, Oklahoma

New Weather Bureau in Full Swing
Plans for Lighted Airway Between Tulsa and Kansas City

Air traffic at the municipal airport has steadily increased since it started. 1938 showed considerable increase over 1937 with approximately 46,200 persons arriving and departing in 10,200 planes in 1938 and 43,000 persons arriving and departing in 9,000 planes in 1937.

During the International Petroleum Exposition in June there were 11,009 persons arrived and departed in 2,121 ships—a world's record in any one month for any airport and we think it still stands.

The new Weather Bureau is in full swing with 5 men employed and 24 hour service.

The new lighted airway between Tulsa and Kansas City will be equipped with nine new one million candle power beacon lights in 1939. This was a long fought struggle for some 8 years and location of lights and all surveys have been made so that it will be set up some time this year.

Al Gutherie of Stillwater carried food into the Mid-Continent Refinery grounds at West Tulsa for a few days during a strike which is still in progress. Al hops off from this port with the food, so the boys all got plenty to eat and are still getting it.

Floyd Muncie from Fort Smith is doing a nice charter business from this airport with his two planes—a Stinson and a Waco.

Gar Wood and his son, Gar Wood, Jr., qualified recently in tests which made Tulsa Municipal Airport a seaplane base. Wood senior was at the controls when they approached the airport in the seven-passenger, two motored plane. They started to glide in and Wood partially lowered the landing wheels. Then they decided to circle the city and so withdrew the wheels and went on. Back at the airport again, Wood senior turned the controls over to Wood junior who came in for a landing, the wheels still snug in the hull. Somewhat embarrassed, the Woods said they had forgotten the wheels in the exchange of the controls. Nothing was damaged, however, and the plane was lifted sufficiently to lower the landing gear and taxi into the hangar.—*CHARLIE W. SHORT, JR.*

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CAA Training Program

(Continued from Page 11)

struction of aircraft designed for use by the private flier. This calls for nothing new or unknown; it simply contemplates the requirement that known or proven safety features be incorporated in the fundamental design of such aircraft.

It is not our intention to penalize a struggling aircraft industry which has been producing airplanes that are as safe and easy to operate as it is possible for them to build under the financial and other handicaps which they face. Heaven knows few, if any, of them have been making any money, and I think we all agree that they have been doing the best they can in the face of circumstances over which they have very little control. What we hope to do instead of penalizing such manufacturers is to hang up a premium for them in the form of more lenient regulations if they have the initiative to produce future aircraft with safer performance characteristics than are now embodied in the conventional type airplane. To be specific again, and to forestall any possible misunderstandings, we think that a sound approach to this problem is to be cut in half or reduce by some other substantial fraction the amount of dual and solo flying time now required for a private pilot's license on conventional type airplanes, provided such instruction is given in planes which will not stall or spin, which have exceptionally good visibility, and which stay on the ground after the pilot lands them regardless of gusty or other unfavorable wind conditions. Such a change in the regulations would supply an immediate and tangible reward for the manufacturer who develops and markets such an airplane, because it would cut in half the time and consequently the expense of learning to fly.

In conclusion, I would like to say that the Civil Aeronautics Authority believes future experience will show private flying to be no more hazardous than driving automobiles on our congested highways provided: (1) that the standards of flight instruction and subsequent flying operations be raised by sane and constructive regulations, and (2) that the development and use of inherently safer aircraft is required. Private fliers today are the nucleus around which this program is to be built. Without your aid and cooperation it cannot be a complete success, and we rely on your support.

Remember The Dates!

MARCH 2-3-4

Second Annual

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Mrs. Geo. Haddaway, Ladies Reception

REMEMBER the exceptionally fine work accomplished and the many good times had in Oklahoma City last March that distinguished the Southwest Aviation Conference as the most militant of all regional conferences? 1939 offers even greater opportunities for constructive work. Be on hand when the opening guns are fired March 2 in Fort Worth.

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